ADDIS ABABA UNIVERSITY

COLLEGE OF DEVELOPMENT STUDIES

CENTER FOR REGIONAL AND LOCAL DEVELOPMENT STUDIES

ANALYSIS OF THE PERFORMANCE OF EXPORTS AND COMPETITIVE ADVANTAGE FOR GROWTH AND DEVELOPMENT IN ETHIOPIA: THE CASE OF SESAME SEED

BY:

MASRESHA YIMER KELKELE

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ADVISOR:
ANDUALEM GOSHU (PhD)

A THESIS SUBMITTED TO THE COLLEGE OF DEVELOPMENT STUDIES CENTER FOR REGIONAL AND LOCAL DEVELOPMENT STUDIES OF ADDIS ABABA UNIVERSITY IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN REGIONAL AND LOCAL DEVELOPMENT STUDIES

NOVEMBER 2021
ADDIS ABABA, ETHIOPIA

DECLARATION

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

Student's Name

Masresha Yimer Kelkele _____ _____

Candidate Signature Date

This is to certify that the above declaration made by the candidate is correct to the best of my knowledge as an Advisor.

Approved by thesis Advisor:

Andualem Goshu (PhD) _____ _____

Signature Date

Addis Ababa University

School of Graduate Studies

This is to certify that the thesis prepared by Masresha Yimer Kelkele entitled "Analysis of the Performance of Exports and Competitive Advantage for Growth and Development in Ethiopia: The Case of Sesame Seed" and submitted in partial fulfillment of the requirements for the Degree of Master of Arts in Regional and Local Development Studies complies with the regulation of the University and meets the accepted standards with respect to originality and quality.

Advisor's Approval:

Advisor	Signature	Date

Examiner's Approval:

Internal Examiner	Signature	Date

Examiner's Approval:

External Examiner	Signature	Date

ACKNOWLEDGMENTS

First and foremost, I would like to express my special thanks to my Advisor, Dr. Andualem Goshu, for his continued guidance and constructive comments and suggestions during the development of the research proposal up to successful completion of my MA research thesis. This is, of course, beside the very attractive and excellent quality of course instruction and management of postgraduate students during the different courses I have had the opportunity to take during the course of my Master's study in Regional and Local Development Studies (RLDS).

I would also like to extend my special thanks to my Examiner, Dr. Filmon Hadaro, whose constructive comments were instrumental in the further structuring of the research proposal and the final preparation of the research study report.

I am also highly indebted to the different institutions and persons/key informants contacted having relevance to the sesame seeds sub sector, for their wholehearted support and advice on provision of relevant public information at their disposal for the purpose of this study.

I should also extend my thanks to my family members and also relatives for their kind encouragement and support to me throughout my study and also during the period of the thesis research paper work.

Last, but certainly not the least, I would like to express my deep respect to the Almighty God for His kind spiritual care, support and encouragement to me throughout my study and the thesis work period.

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LIST OF ACRONYMS AND ABBREVIATIONS IN THE TEXT

AAU	Addis Ababa University
AIC	Akaike Information Criteria
ARDL	Auto Regressive Distributed Lag
B2B	Business-to-Business
ECA	Economic Commission for Africa
ECLAC	Economic Commission for Latin America and the Caribbean
EC(M)	Error Correction (Model)
ESCAP	Economic and Social Commission for Asia and The Pacific
EXPPPRATIO	Export price to producer price ratio of sesame seed
EXVAL	Export Value of Sesame Seed
EXVOL	Export Volume of Sesame seeds
FAO	Food and Agriculture Organization
GDP	Gross Domestic Product
GDPeth	Gross Domestic Product of Ethiopia (current)
GDPpc	Gross Domestic Product Per Capita
IMD	Institute for Management Development
IMPDD	Import trading partners demand measured by export share weighted GDP per capita
MOT	Ministry of Trade
MoTI	Ministry of Trade and Industry
NBE	National Bank of Ethiopia
RCA	Revealed Comparative Advantage
REER	Real Effective Exchange Rate
RRCA	Regional Revealed Comparative Advantage
RSCA	Revealed Symmetric Comparative Advantage
SC	Schwarz Information Criteria
UNCTAD	United Nations Conference on Trade and Development
USD	United States Dollar
WEF	World Economic Forum

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ABSTRACT

Based on the general objective of the research to describe and analyze the sesame seeds production, comparative advantage and export trade performance, competitiveness and export potentials of Ethiopia, from the perspective of the global and African regional levels, the study addressed four specific objectives, covering the period 1970 to 2018, by using market share, growth rate and related trade performance indicators, RCA and RSCA, export and import geographic concentration ratios analysis, econometric analysis using the ARDL model, and also carried out assessment of sesame seed export potential by utilizing UNCTAD export potential and gap methodology. For the ARDL econometric model post estimation diagnostic tests were also carried out. Africa's share of world sesame seed export volume is about 65.5%, the leading exporters and their global export volume share are: Sudan (21.8%), Ethiopia (11.4%), followed by Nigeria (10.6%). Ethiopia's RCA and RSCA have been higher though showing declines recently. Ethiopia's leading export destination (61.9%) is China (also the world number one importer) and 20.4% to Israel (the world 6th importer of sesame seed). Ethiopia's export concentration ratio was a high of 0.33, higher than the global average of 0.11; while the importer's concentration ratio of the leading importing country, China, was 0.18, indicative of higher number of supplying countries, and implying higher competition in exporting to China. The ARDL econometric model analysis revealed that in both the short run and the long run, EXVAL (sesame export value) and EXVOL (sesame export volume) are affected statistically significantly by GDPeth (positively), REER (negatively), IMPDD (negatively). On elasticity results, both equation 1 (EXVAL) and equation 2 (EXVOL) are highly elastic to three of the four independent variables, namely, GDPeth, REER and IMPDD, both in the short and long run. Regarding Pairwise Granger Causality Test results, while both EXVAL and EXVOL does granger cause GDPeth, reinforcing the importance of export development as engine of economic growth, EXPPPRATIO granger cause EXVAL as well as EXVOL. Besides, EXVAL as well as EXVOL have bi directional causality with REER. Regarding the export potentials, Ethiopia has huge untapped export potential in sesame seeds, with current export to total world potential percentage share at 32.7% - an export untapped potential of 67.3%. Finally, towards maintaining and improving the comparative advantage & boosting the competitiveness of sesame seeds export, the study recommends: expanding sesame seed of production; improving product quality and value additions and the domestic marketing system (including ECX trading system); pursuing export market and product development and diversification; streamlining trade logistical and other domestic cost push factors; addressing the misalignment in exchange rate and the appreciating REER; developing and maintaining highly professional exporter companies, by implementing the identified respective strategies for action.

***Key words**: Sesame seed, Comparative advantage, Export analysis, End market analysis, ARDL, Export potential*

CHAPTER ONE: INTROUCTION

1.1 Background of the Study

The role of trade in development process has taken special importance in classical to modern trade and development theories, including the consideration of trade as an engine of growth.

In Ethiopia, the predominance of primary agricultural commodities in the export portfolio of the country has continued to be the norm, and diversification of the export mix in an organic manner, with forward and backward linkages to the domestic economy, application of modern technologies and practices, and further value added production, is far from the reality on the ground.

The share of agriculture in total GDP (Gross Domestic Product) has been showing a declining trend, from 55.3% in 1999/00 to 35% in 2017/18 - with Service GDP rising from 37% to 39.2% and Industry's GDP increasing from accounting for 9.7% to 27% (NBE,2018/19). Agriculture has continued to be a major source of export earnings and also source of employment. However, agricultural practices have largely remained traditional and predominantly small holder-based.

Following the Imperial and Derg regimes, during the post 1991 period to date, the government of Ethiopia's has been making and implementing different development policies and strategies that cover: The Sustainable Development and Poverty Reduction Program/SDPRP (2002/03 – 2004/05), Agricultural Development Led Industrialization (ADLI), Plan of Action for Sustainable Development and Eradication of Poverty /PASDEP/, 2005/06 – 2009/10; GTP (starting 2010/11 – 2014/15). Besides, there have also been strategies pertaining to investment and export promotion as well.

Consequently, the Ethiopian economy has been showing improving growth trends. For instance, the Ethiopian economy, which had showed 9.3 percent average annual growth during 2013/14 - 2017/18 fiscal years, recorded 7.7 percent growth in 2017/18 fiscal year, slower than the growth rate registered in the previous year owing to growth deceleration in agriculture and industry sectors (NBE, 2017/18).

There has been favourable response of export earnings to economic policy in the post 1991 period but also with significantly rising import bills, resulting in a significantly large and negative merchandize balance of trade of 13.83, 12.89, and 12.46 billion USD (NBE, 2017/18).

Ultimately, competitiveness in exporting implies the need to face competitive environment and win markets from competitors and getting increased market share in the global market place. Thus, from the point of view of export development and competitiveness, it become crucial to have proper understanding of the international market performance, competitiveness factors, competitors' analysis, and international market trends and potentials.

In Ethiopia, sesame seed production has also been on the increase over the years, in which production is predominantly a small holder farming system (90%) and about 10% accounted for by commercial farms with larger farm sizes (Sorsa, 2009).

Sesame seed is a highly export-oriented commodity. According to USDA, 2016 (as cited in Lehr & Yared, 2018), unlike other international sesame producers, Ethiopia's sesame is mainly produced for the international market, with nearly 75% going to exports. 95% of sesame seed is exported as natural or raw sesame seed without further processing. There is, hence, very limited export of sesame oil or tahini (sesame paste) recently.

Expansion of exports is often behind spurts in economic growth— but the export engine is sputtering (World Bank, 2014). Further, the report indicated Ethiopia's exports have very low product differentiation and sophistication and least complex ones. Goods with low human and physical capital, and low modern technology use dominate the factor content of Ethiopian exports.

Thus, there a lot that can be gained from research and analysis into such traditional/classic export commodities, as sesame seed. This, however, requires not just analyzing the export performance of the exporting country alone (Ethiopia), but also about looking into the specific commodity's global market performance in general and also examining the performance of key competitors' in the international

market place, and also examining the factors influencing/affecting its export competitiveness in particular.

1.2 Statement of the Problem

Sesame seed can be considered a highly traditional/classic export commodity of the country. In fact, it was also one of the export commodities promoted since the then Imperial government following the export promotion trade policy at the time, during its three five-year development plans.

Generally, agricultural commodities have low price and income elasticity of demand, and exporting countries are often price takers in the international marketing of the commodities. This research was inspired by some of the following major gaps in research observed in traditional export commodity related studies, and in particular, sesame seed.

First, while exporter's earnings do vary in response to global market developments (Kindie, 2007), recently, there has been major losses incurred by sesame seed exporters, with export earnings per ton falling far below domestic total exporter cost per ton (Lehr and Yared, 2018). In the last 2018/19 fiscal year, for instance, sesame export market experts indicate shortfall of export earning per quintal as much as -6,000ETB, with its implication of downward pressure on farm gate prices.

In this respect, some of the major challenges facing exporters include: low farm productivity, affecting sesame supply and quality, inadequate marketing infrastructure resulting in increased transport cost affecting competitiveness, extended downward supply chain (which reduces the profit margin of producers and thereby hindering their incentive to produce more), delay in provision of credit for working capital for cooperatives, low bargaining position of sesame seed farmers, extensive number of brokers between farmers and exporters chain, lack of transparency, accountability, commitment and bureaucracy of the government system, lack of accurate and timely and reliable market information on domestic supply and international market prices, information, specifically on production and

global sesame price forecasts; and also export defaults due to international price volatility (UNCTAD, 2018).

Second, most studies have preoccupation towards the study of the domestic production and marketing system, focusing on the lengthy traditional farm to market chains of sesame seed trading, with limited analysis of the Ethiopian Commodity Exchange (ECX) system that has replaced the traditional sesame seed trading system, as of 2008. (Demelash, 2004; Lehr and Yared, 2018; Kindie, 2007).

The importance of the ECX trading system and its implication need to be emphasized in that the ECX trading system was designed not as an optional or as a parallel trading system, rather, as a mandatory and sole trading system through which sesame seed trading (esp. for exports) has to pass through in Ethiopia. (ECX website, 2019)

Important proclamations in this regard are Proclamation No, 551/2007 Ethiopia Commodity Exchange Authority, i.e., a Proclamation establishing the Regulatory agency of the ECX trading floor (MoT website, 2020); a proclamation to provide for the establishment of the Ethiopia Commodity Exchange Proclamation No. 550/2007; and other important regulations pertaining to sesame seed trading, such as, Council of Ministers Regulation No. 178/2010; the Ethiopian Commodity Exchange (Amendment) Proclamation No.665 /2010; the Sesame and White Pea Beans Transaction Council of Ministers (Amendment) Regulation No. 307/20 14 (ECOLEX website, 2020).

For instance, the Sesame and White Pea Beans Transaction Council of Ministers (Amendment) Regulations No. 178/2010 and also No.307/2014, stipulates that the supply of sesame transactions at the primary transaction centers shall be effected only between sesame producers and suppliers; while the transaction of sesame at the Ethiopian Commodity Exchange shall be carried out only between producers or suppliers and exporters or processors based on the Ethiopian Commodity Exchange rules. Furthermore, the Ethiopian Commodity Exchange (Amendment) Proclamation No. 665 /2010 further specifies that the Council of Ministers may issue regulations

to determine conditions allowing the trading of a commodity exclusively at the Ethiopian Commodity Exchange and sanctions applicable with respect to noncompliance therewith (ECOLEX website, 2020).

As further discussed in UNCTAD study (2018), sesame marketing in Ethiopia is governed by the Council of Ministers' Sesame and White Pea Beans Transactions Regulations. As per the regulations domestic transactions between producers and suppliers take place at primary transaction centers. For international transactions, suppliers are obliged to transact only at Ethiopian Commodity Exchange (ECX) with exporters.

Third, the available studies analyze export performance from the exporting country (Ethiopia) perspective (i.e., what the country has exported in volume and value terms), and not devolving into the global market competitor performance, and global end-markets development trends, including trade potentials of sesame seed in major end markets (Demelash, 2004; Lehr and Yared, 2018; Kindie, 2007).

Fourth, sesame seed being one of the most established and traditional primary export commodities from Ethiopia, the research also aimed to investigate if there are any emerging developments towards further processing or transformation (such as de-hulling, sesame seed oil production, etc …).

Last but not the least, as a research to be undertaken in 2019/20, this research aims to utilize the most up to available and reliable international trade statistics at national, competitor countries' (in the African region and beyond), and at global levels for the purpose of this research, thus, capturing the latest developments in the export performance and competitiveness of sesame seed. In this regard, in addition to the quantitative study, this study also aimed to contribute to filling the gap on current developments regarding the business enabling environment, export performance and competitiveness challenges of the sesame seed export sector from the pertinent stakeholder institutions in the sub sector.

1.3 Research Questions

The research aimed to respond to the following four research questions:

- ✓ What are global, and in particular, African Regional competitors and Ethiopia's sesame seeds production, export trade performance and competitiveness developments and trends?
- ✓ Which are the destination/end-markets & their performance; and comparative advantage developments and trends of Ethiopia and the major African Regional Competitors?
- ✓ How are the factors affecting the export competitiveness of Ethiopian sesame seeds?
- ✓ How big/small is the sesame seed export potentials of Ethiopia (and comparatively, those of major African regional & global competitors) in main import trading partners/destination markets?

1.4 Objective of the Study

1.4.1 General Objective

The general objective of the research was to describe and analyze the sesame seeds production, comparative advantage and export trade performance at the global and African regional levels, and Ethiopia; to analyze Ethiopia's sesame seeds export performance and direction of trade/destination markets; to explain the factors affecting the export performance and competitiveness of Ethiopia's sesame seed exports; and also assess Ethiopia's sesame seeds export potentials in major import trading partners/destination markets.

1.4.2 Specific Objective

Accordingly, the specific objectives of this research were to:

i. Describe and analyze Global, and in particular, African Regional competitors and Ethiopia's sesame seeds production, export trade performance and competitiveness analysis,

ii. Analyze end-markets (destination markets), geographic concentration/dispersion of exports, and related trade performance indicators, and comparative advantage (using RCA & RSCA) of Ethiopia and the major African Regional Competitors,
iii. Explain the factors affecting Ethiopia's sesame seeds export trade performance and competitiveness (using ARDL model, multivariate econometric method), and
iv. Assess Ethiopia's sesame seeds export potentials (and comparatively, those of major African regional & global competitors) in main import trading partners/destination markets globally.

1.5 Significance of the research

The research will contribute to properly know the factors currently affecting the export performance and competitiveness of sesame seed in the intentional market place. Importantly, the research made depth review of the end market analysis, beside mere examination of national export performance, to know the major developments and trends in the global sesame seed market impacting sesame seed export performance and competitiveness of Ethiopia. The research also enables to know the domestic to end market major factors affecting export trade and competitiveness in sesame seed, which is the leading export commodity in the oil crop category.

Finally, given the continued importance of primary commodities in national export of Ethiopia, the bottom line is to find out necessary policy measures and strategies to apply to boost production, export performance and enhance competitiveness with respect of sesame seed, to enable the sector play its highly expected role in local, regional and national development endeavours. Such findings could also have important contributions to addressing the pressing constraints in export and competiveness in other primary agricultural commodities as well.

1.6 Scope of Study

This study made an analysis of global, African regional competitors as well as Ethiopia in terms of production, comparative advantage and exports performance and competitiveness, and also analysis of global end markets/destination markets, while also making a further depth analysis of the factors affecting sesame seeds export from Ethiopia, as well as assess the export potential of Ethiopia's sesame seeds exports in major target markets.

1.7 Organization of the Paper

This research thesis has six chapters. The first chapter deals with the introduction, problem statement, research objectives and research questions of the study, significance of the study, and the scope of the study. Chapter two presents the related literature review section and includes a brief overview of the Ethiopian economy and its international trade and sesame seed sub sector, a review of theoretical and empirical works related to comparative advantage and competitiveness of agricultural primary and processed commodities and products at country and regional levels, and also the conceptual framework of the study. Chapter three discusses the research design, data types and sources, methods of analysis for the four objectives of the study, including ethical considerations. Chapter four presents the research results, while Chapter five makes discussions on the research results and also empirical findings from other studies. Chapter six makes conclusions and recommendations based on the findings of the study.

CHAPTER TWO: RELATED LITERATURE REVIEW

This section will cover three sub sections. The second sub section (2.2) brief overview of the Ethiopian economy, international trade and the Sesame seeds sub sector. Section (2.3) covered the theoretical review. Then, the fourth sub section (2.4) made an empirical review related to the research.

2.2 Ethiopia's Economy, International Trade and the Sesame Seeds sub sector

2.2.1 Ethiopia's Economy and International Trade

As much as emphasizing the role of trade in development and as an engine of growth, there are also literature discussing the dangers of primary commodity export dependence and the deteriorating terms of trade such exporting countries face, with its major implications in their economic growth and national development endeavors.

Ethiopia is classified as one of the low income developing countries, with low GNI Per Capita, based on World Bank Atlas Method, 2007 (Todaro and Smith, 2012). It is a highly agrarian economy with a predominately traditional small holder agriculture sector.

The predominance of the agricultural sector in the national economy is easily discernible when we see that 90% of the national foreign exchange/export earning is derived from the agricultural sector, and in particular from the export of natural or raw unprocessed agricultural commodities. Moreover, agriculture is a main source of employment, with direct and indirect employment contribution spanning to about 85%.

Despite its critical importance in the national economy, the agricultural sector is characterized, among others, by fragmented plots of land for the largely small holder agriculture, low productivity and highly traditional farming practices, and low modern agricultural technology adoption (such as high yielding variety seeds, pest and plant and livestock disease controls, mechanization, rain fed agriculture, irrigation, etc … the agricultural sector is also facing major challenges from increased population pressure and soil and environmental degradations, and the increasing impacts of climate change. Agriculture is highly traditional and mainly small holder agriculture based. As a result, Ethiopia has a significantly rural population with high exposure to

recurring shocks and stress, with limited and highly fragile asset base, exposed to livelihood challenges and frequent food insecurity problems.

As a developing agrarian economy, Ethiopia meets its needs for non- durable and durable consumer goods, machineries and equipment, transport equipment, including fuel, through imports. As a country exposed to recurring drought and food shortages, Ethiopia also makes huge imports of food aid as well as commercial import of food to provide for the food needs of chronic and transitory food insecure populations.

In Ethiopia, both export promotion an import substitution polices has been pursued during the pre-1991 period. The current economic policy was made with a shift to a market economy policy in 1992, replacing preceding socialist command economic system that according preponderant role to the state in the economic sector, including import and export activities. Prior to that (pre 1974 period), Ethiopia had an Imperial government led that had 3 five year development plans with import substitution and then export promotion strategies regarding international trade.

Then, during the post 1991 period, Ethiopia has been following export promotion development strategy. However, as of the current Growth and Transformation Plan II, the need has been felt for the promotion of exports while at the same time to promote import substituting industries in a bid to reduce the huge foreign exchange demand for investments and import requirements (FDRE, 2016).

Ethiopia's merchandize export earning has been responding favourably to the economic policy and associated reform efforts, with the major exports of the country being carried out by the private sector, as opposed to the government parastatals, during the pre- 1991 Derg period.

On the other hand, there have also been continually rising import bills of the country, with the export earnings' coverage of import bills, resulting in a rising and large negative balance of merchandise balance of trade. Export earning of the country increased, for instance, from 2.87 billion USD in 2015/16 to 2.91 billion USD in 2017/18, but declined to 2.84 billion USD in 2017/18. On the other hand, the import bill of the country was 16.7, 15.8 and 15.3 billion USD in 2015/16, 2016/17 and 2017/18 respectively, resulting in a significantly large and negative merchandize balance of trade of 13.83, 12.89, and 12.46 billion USD (NBE, 2017/18).

This situation has recently been causing major capacity limitations of the country to meet foreign currency needs of importers, payment commitments, and affecting proper procurement and completion or advances in different public and private projects in the country, and trade, investment and business activities, thereby affecting government revenue, employment creation, and undermining possible expanded multiplier effects throughout the economy.

For successful exporting, it is crucial to build competitiveness in the global market place as a way for enhancing export development. Export promotion and development can be considered as one major instrument in the country. However, the export sector performance, diversification and competitiveness challenges remain diverse and huge to this day, and, hence, need to be addressed in multidimensional manner.

The exports of least developed countries are largely dominated by export of primary commodities. According to UNCTAD policy studies series No. 54 by Nicita, Shirotori &Tumurchudur Klok (2013), exports of LDCs are still largely concentrated in very few sectors and are often limited to primary commodities. Diversification, or the lack of it, is reflected in the statistics. The index of export concentration (Herfindahl–Hirschmann) for LDCs has been increasing over the past 10 years. In 2009, the concentration of exports of LDCs was about four times as large as that of developing economies as a whole.

Production of sesame seed is largely carried out in small holder farms (about 90%) and the rest accounted by larger farm size commercial farms. For instance, Sorsa (2009) noted between 1998 and 2005-06, the total area of production and the quantity of sesame produced has grown threefold. According to different assessments and the plan of the Ministry of Agriculture and Rural Development (MoARD), sesame production can potentially triple again. Hand in hand with Ethiopia's great potential for the production of oilseeds, he further emphasize the need to recognize the multifaceted sesame seed production- and marketing-related problems facing the country, including the level of productivity of sesame (seven quintals/hectare) is by far below 50% of the estimated potential of the country and the average productivity level of other sesame-producing countries.

A sesame seed farm to market chain analysis for metema area, carried out by Kindie (2007), prior to the mandatory Ethiopian Commodity Exchange (ECX) trading system, revealed 94% of

total production of the area was supplied to the market. Besides, Ethiopia's sesame seed is a highly export oriented commodity, with 75% going to exports and with 95% exported as natural or raw sesame seed without further processing, while the sesame that is not exported is mostly used for seeding, oil crushing and baked products (USDA, 2016, as cited in Lehr & Yared, 2018).

A World Bank report on Ethiopia (2014) elaborated the characteristic features of Ethiopia's export sector. The export sector Ethiopia's development model is partly inspired by the East Asian experience that realized high economic growth through the development of new export sectors and government-led development investments.

Expansion of exports is often behind spurts in economic growth. There is also a foreign exchange element of exports that is important for sustainable growth of an economy. Exports indeed appeared as a driver for economic development in Ethiopia over the past Decade — but the export engine is sputtering (World Bank, 2014).

Further, the World Bank report indicated Ethiopia's exports have very low product differentiation and sophistication and least complex ones. Goods with low human and physical capital, and low modern technology use dominate the factor content of Ethiopian exports (World Bank, 2014).

Hence, given this historically long standing and continued importance of traditional or classic commodities in export earnings, further examining the performance and competitiveness issues pertaining to primary commodities, such as sesame seed, cannot be overemphasized.

2.2.2 The Sesame Seeds Subsector

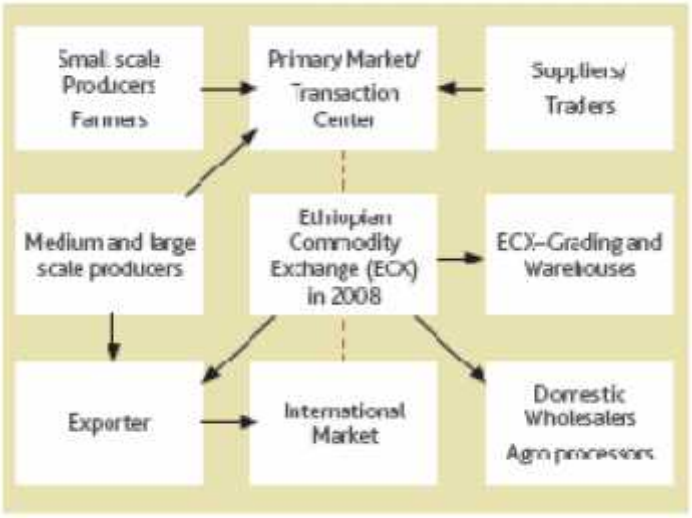
In Ethiopia sesame seed is the predominant oilseeds exported to the international markets, accounting for 85% or more of oilseeds exports (FAO, 2019). The Major producing regions of sesame seeds in the country are Amhara, Tigray and Oromia and the Benishangul Gumuz regions (Terefe, 2016; Kindie, 2007).

On sesame seed farming, use of shattering varieties of sesame seeds do cause major problems in affecting production and yield, as use of shattering type of seeds contribute to significant handling labour cost and also expose growers to major crop losses during thrashing. As per Ruters et al. (2015), shattering is the release of Sesame Seed when the sesame capsule splits. This happens during ripening, and it can attribute for the loss of more than 30% of the produced sesame during threshing.

On the critical role of cooperative associations and unions, while they could play vital role in sesame seed production and marketing, cooperative associations and unions in the growing areas in the country have serious weaknesses and limitations to discharge their responsibilities properly and efficiently. In this respect, a study on Cooperatives, in North West Ethiopia sesame seed growing areas found out that cooperative Unions are not performing to the best of their potential; have weak export performance; and faced with major challenges of marketing, access to finance, cooperative governance (Agriterra, 2014)

While historically, sesame seed has been traded domestically using traditional agricultural marketing channels, covering, producers, rural collectors, regional wholesalers, urban wholesalers, and exporter's chain, and the number of regional to local trade agents/brokers involved.

As of 2008/09, with the establishment of the Ethiopian Commodity Exchange (ECX), the export of sesame seeds has been legally mandated to take place through the ECX trading floor, though the series of revisions to the ECX proclamation and regulations also imply commercial farmers, cooperative unions can directly export, while all other exports have been required to buy the sesame seeds based on set ECX commodity grades, through the ECX trading floor. Following the establishment of the ECX trading system, the sesame seed value chain mapping and relationships between the value chain actors is depicted in Figure 2.1.



Source: Ruters et al., 2015

Figure 2.1: Mapping the Sesame Seed Value Chain in terms of Relationships between the value chain actors

Ethiopia predominantly exports natural sesame seeds to the international market, though there are few export companies trying to export dehulled sesame seeds and also sesame seed crude oil export (e.g., to the Netherlands).

2.2.3 Sesame seed products

While natural sesame seed is the predominant export from Ethiopia, there are different value added products that can be made from it, such as de-hulled sesame seeds, use of sesame seeds in biscuits, Tahini, bakery and other confectionary applications, use of sesames seed for extracted and refined edible oil production, etc.

Sesame seed is a very important oil crop with diverse products and uses. It is widely used in the edible oil processing, confectionary and biscuits, bakery, and other applications. In Ethiopia, sesame seed is mainly used as natural sesame seed for exports, and also some uses in de hulled sesame seed, crude sesame oil for export and tahini production in a plant Gonder (now owned by Ambasel Trading House plc).

As part of the product differentiation, there are important potentials to be considered for organic certification as well as value addition on natural sesame seed exports for improving exports and competitiveness. For instance, organic certification offers 20-30% premium over natural sesame seeds exports (Chemonics, 2002). Besides, engaging in further value addition activities in sesame seeds also offers 30 % premium on export price over natural sesame seeds (Chemonics, 2002), as 95% of exports being in natural sesame seeds form (Agriterra, 2014), with de hulling experience limited at the moment to just 3 companies (Setit hulling Plc, Dipasa Agr. Plc, and Ambasel trading Plc),

Table 2.1 shows the different products that can be made from sesame seeds, which should also be an important area of attention for sesame seeds export development, diversification, and competitiveness in Ethiopia.

Table 2.1: Sesame Seed Products

Input	Products	Description and Uses
Seeds	Confectionery	Fried seeds may be bound together with sugar syrup to give sweetmeats.
Seeds	Biscuits	The whole seeds can be baked into biscuits.
(Hulled) seeds	Bakery	Popular in northern Europe either incorporated into breads or as decorative toppings. May be used hulled or whole.
Seeds, sometimes roasted	Oil	Particularly used in oriental cuisine. The flavor is quite strong and rarely compatible with traditional Western style cooking but also used as a salad oil.
Oil	Medicinal treatment	Ulcers and burns
Oil	Margarine	Once an important use, now other cheaper vegetable oils are available
Oil	Aerosol	Reported use as a synergist for pyrethrum sprays
Low grade oil	Various	Soaps paints, lubricants, and illuminants. Local uses, of no importance in international trade
Hulled seeds	Tahini	A paste of sesame seeds which is used as an ingredient in eastern Mediterranean and Middle Eastern foods
Tahini	Dips &spreads	Various ingredients, such as chickpeas or eggplants, are added to tahini to make dips and spreads such as hummus
Tahini	Halva	A sweet made from tahini and sugar with other added flavorings
Cake	Animal feed	Protein rich useful supplement
Cake from hulled seeds	Ingredient	Used in some Indian cooking. Also as a snack in, for example, the Nigerian Kulikuli.

Source: Chemonics (2002)

2.2.4 The Oilseed crops producer - Edible Oil Major Importer Paradox in Ethiopia

2.2.4.1 Background

Ethiopia is a major producer of oil crops next to cereals and pulses. The oilseed crops produced in Ethiopia cover *niger* seed, rape seed, sesame seed, cotton seed, sunflower, linseed, and ground nuts, including soya bean (a legume). In fact, Ethiopia is among the top five leading oilseed producing countries of the world. Next to coffee, oilseeds are the second largest export commodities that earn hard currency for the country. More than three million small holders are involved in the oilseeds, pulses and spices production (EIAR).

2.2.4.2 The Domestic Edible Oil Processing Sub sector

Ethiopia is a well-known as exporter of some of the oil seeds, such as sesame seed and *Niger* seed. Ethiopia's oilseed sector plays an important role in generating foreign exchange earnings. The three major oilseed crops (sesame, soybean, and niger seed) contribute to nearly 20% of Ethiopia's total agricultural export earnings, second only to coffee. In 2018/19 (Oct-Sep), exports of sesame, Niger seed, and soybeans generated nearly $430 million in export earnings. In addition, the oilseed sector provides income to millions of growers and others market actors along the value chain (USDA, 2020). Ethiopia has a long history of domestic production and supply edible oil, through nationally distributed majority of village or local level small scale edible oil millers, and very few edible oil processing facilities in different urban and rural parts of the country, by utilizing domestically sourced oilseed crops as their raw material. In fact, this makes the edible oil sector a good example of having a higher linkage with the agriculture sector, while most industries in the country have high import dependence, of 60% or more, for their raw materials and other input needs (CSA, 2020).

In Ethiopia, the weakening of domestic edible oil production and rising demand for edible oil implies the need for imports (about 85% of supply) to meet the demand-supply gap. However, import requires allocation of foreign exchanges from the meager exports earnings of the country.

On this, FAO (2011) further discussed that for cash-strapped countries; persistent food import becomes a problem when the high and rising food import bills take money away from other important development agendas without resolving food insecurity. In line with this argument, Ethiopia's rising import bill for edible oil is also aggravating the already alarming balance of trade deficit. Ethiopia's overall national net trade balance deficit was 13 billion USD in 2018/19 Ethiopian fiscal year (NBE, 2018/19). This increasing edible oil imports is resulting in a huge foreign currency demand valued at nearly 550 million USD in 2018; with volume of import expected to reach 584,000 metric tons in 2020 (USDA, 2020); and also the introduction imported edible oil price subsidy budgetary allocation by the government, including capping of local selling prices to make it affordable to the majority of consumers; recurring shortages of edible oil in the market, and the need for developing new taste for the consumers.

Besides, from the nutritional security perspective, edible oil has a major role to play both as a food and also as a vehicle for fortification of vital micronutrients (fortificants), such as for Vitamin A, and in the effort to meet the targets of the Sekota Declaration (2016), which is aligned to the SDGs (GAIN, 2020).

Besides, the weakening of the domestic edible oil production has also resulted in the reduction in the supply of the important by-product called Oil Cakes, which are sold by the edible oil processors as animal feed.

A review on the domestic edible oil production in Ethiopia by Ruters et al. (2015) highlights that despite the large production of sesame and linseed, Ethiopia still imports large amounts of edible oil, mainly palm oil. Palm oil is mainly imported from Malaysia, Singapore, and the United Arab Emirates. Local production is only able to meet about 5 % of the demand. Only 15 oil-processing plants are annually processing 40,000 tons good quality edible oils; otherwise 850 informal, small and micro scale cottage oil seed processors are extracting crude oil. In the high-end market, especially in Addis Ababa, sesame seeds are sprinkled on bread, bagels, and hamburger buns.

Moreover, Wijnands et al. (2009) indicated oilseed crushers produce around 20% of the domestic consumption of edible oil, while 80% is imported as palm oil, sunflower, and soybean oil. MOTI (2020) working document shows current existing large and medium edible oil processors capacity utilization to be at about 30%. Currently, new large scale edible oil processing plants are being established in the different regions, and agro industry parks.

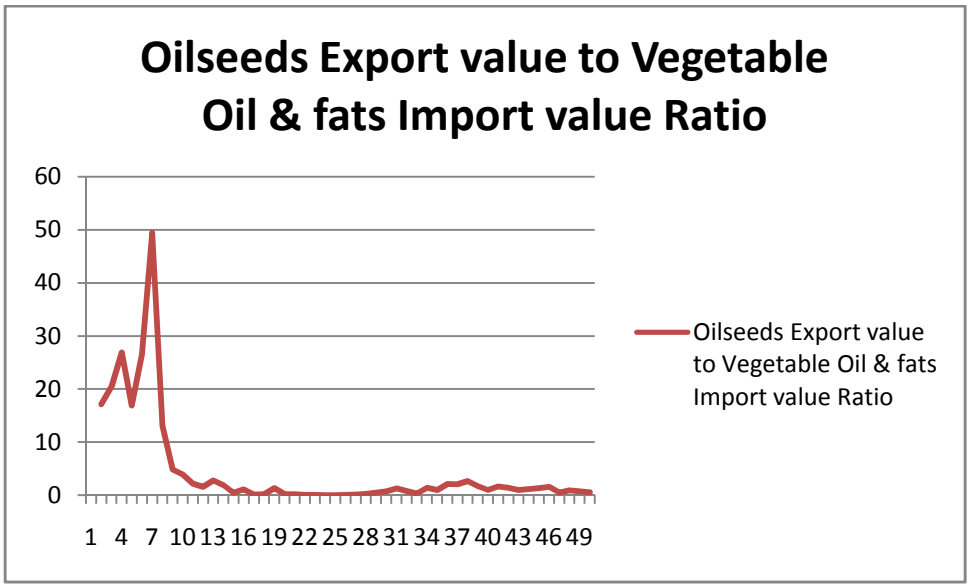
2.2.4.3 The Paradox

Thus, there exists major paradox in the edible oil sector of Ethiopia. On the one hand, the country is (the origin for some) and a major producer of oil seeds, with oil seeds as the major agricultural commodity produced in Ethiopia, following cereals and pulses. The country also has long-held tradition and experience in domestic production and supply of edible oil to consumers. On the other hand, the country relies predominantly on import of edible oil to meet its domestic consumption needs, with large scale export orientation of the oilseed crops, coupled with the significant weakening and closure of many of the Small and Medium edible oil processors located at the village levels.

Analysis on FAO statistics (FAO, 2019) showed that Ethiopia's import of vegetable oil and fats in 1970 was 1,859 tons valued at 656,000USD. This import has been showing very slow, though erratic, increase over many years, reaching, by 2018, 643,270 tons and a value of 604.1 million USD. However, major turn in sharp increase of import of edible oil started around 1999 and 2000. Besides, Ethiopia mainly imports palm oil from the international market. Based on FAO statistics, in 2018, for instance, Ethiopia's import of palm oil was 86.9% of the volume of vegetable oil and fats imports. This share has actually increased reaching 93.9% by 2019. In value terms, the share of palm oil was 81.9% and 88.5% respectively.

Moreover, further trade statistics analysis of FAO data (FAO, 2019), by comparing Ethiopia's oilseed crops export with edible oil and fats import, showed that unlike the situation in the historic past when oilseed crops export had had a significant value in terms of foreign exchange, at the moment, Ethiopia's foreign exchange expenditure on edible oil and fats has been increasing over time, becoming similar to, and at times, displacing the country's oilseeds export

earning in value terms. (See Figure 2.2 on ratio of oilseeds export earnings to edible oil and fats import expenditure).



Source: Computed based on FAO data

Figure 2.2: Ratio of oilseeds export earnings to edible oil and fats import expenditure: 1970-2018

Hence, there is an urgent need for the country to work towards ensuring improving the comparative advantage and competitiveness of its oilseed crops production and exports, including sesame seeds, and its value added products, while at the same time plan and implement major cultivated area, yield, quality and production expansions and improvements in sesame seeds and other oilseed crops in order to progressively substitute the huge import of edible oil in to the country, & its sever repercussions on foreign exchange and government budgetary requirements, as well loss of potential domestic production, employment and income, and backward and forward linkages to agriculture and other sectors in the country.

2.3 RELATED THEORITICAL LITERATURE REVIEW

2.3.1 International Trade Theories

International trade theories do provide the theoretical frameworks and explanations concerning trade patterns, specializations and the distribution gains from engaging in international trade.

On the developments of trade theories, covered the traditional trade theories of Mercantilism (William Petty, Thomas and Antoine Montchrétien Model), Absolute Advantage (Adam Smith Model), Comparative Advantage (David Ricardo model), resources and trade (The Eli Heckscher and Bertil Ohlin Model), New Trade Theories (NTT), including: Specific Factors and Income Distribution (Paul Samuelson - Ronald Jones Model), The Standard Model of Trade (Paul Krugman – Maurice Obsfeld Model), and The Competitive Advantage (Michael Porter's Model) (Wondwosen, 2014).

These theories of international trade include: the Ricardian model, in which technological differences across countries result in differences in productivity; Heckscher &Ohlin theory (H-O theory), in which countries with different resources or factor endowments trade each other; while New trade theories give a central role to increasing returns, product differentiation, consumer preferences, externalities and innovation in explaining these efficiency differences (Topcu and Kilavuz, 2012) and also and endogenous growth theories (Krugman, 1983). On the latter developments in international trade theory, Belayneh (2012) elaborated that Krugman (1979), and Lancaster (1980) in the late 1970s and 1980s, was motivated by the failure of more traditional theories to explain some of the most significant facts about post World War II trade data also draw attention to the role of different attributes that results existence of trade between countries.

Besides, the need for new theories of trade developments was also due to the empirical evidences challenging the traditional theories, such as H-O. For instance, as discussed in Verspagen and Wakelin (1993), the first came from the perceived refutation of the theory by empirical tests such as that implemented by Leontief (1956). Another more recent challenge was the domination of total trade by trade between developed countries with similar factor endowments. Trade between

these countries is also often characterised by intra-industry trade, the simultaneous export and import of the same goods by a country. The other factor was the fact that technological differences as a source of trade were ruled out of the neo-classical factor endowments model as the proof of this theory involved the assumption that the techniques for producing goods were the same across countries, which reduced the role of technology in determining what is produced and traded.

These led to new trade theories referring to technology as a factor in trade. Verspagen and Wakelin (1993) outlined the relevant ones as, technology theory of trade, neo-technology theory (knowledge and skills), the technology gap approach, and strategic R & D, where such endowments will enable countries to trade and have comparative advantage in technology/knowledge intensive goods.

Besides, Huovari et al. (2001) elaborating the conceptual models of competitiveness also discussed that growth theory serves as a natural starting point for a conceptual model of competitiveness. In traditional growth models, production comes from the joining of labour and physical capital with a particular technology, the progress of which is assumed to be exogenous (Solow, 1956; Swan, 1956). New (endogenous) growth models stress that human capital and innovation, as well as technological progress, is another essential production factor. In addition to human capital and innovativeness, the new economic geography provides us a third source of regional competitiveness. Urbanisation, agglomeration, localization and other benefits accruing from external economies form one of the main channels that transform regional balance within nations and are closely related to one another. In this regard, agglomerations tend to have high accessibility due to the size of their own markets and high quality connections to other agglomerations, with innovations having high intensity in large aggolmerations than at the periphery.

2.3.2 Trade and Economic Growth

There is a lot of literature on trade and its importance in economic growth and development, in particular, in recent times, trade has been considered as an important engine of economic growth and countries has been seeking ways to engage in trade competitively to improve their national economic growth and well-being.

The economic benefits of exporting have a long-established theoretical basis (Farole, Reis and Wagle, 2010) that include static efficiency gains derived from exploiting comparative advantage and improved allocation of scarce resources, as well as dynamic gains in the more productive export sector engineered by higher competition, greater economies of scale, better capacity utilization, the dissemination of knowledge, and technological progress. For developing countries, exports are also a main source of hard currency necessary to finance import of capital goods, which are an important source of knowledge spillovers. But not all trade contributes to sustainable, equitable growth to the same degree or in the same way. In particular, they emphasized that the most broadly accepted definition of aggregate national competitiveness is productivity – specifically total factor productivity.

Trade is also an important area of focus by governments. Governments, both domestic and foreign countries do carry out commercial and trade policies. On the role of government in export promotion, Leonidou et al. (2007, cited in Visser et al., 2015) highlighted that Governments may seek to enhance exports in a bid to meet other economic goals, such as enhancing economic activity, increasing domestic employment and generating foreign currency.

2.3.3 Comparative and Competitive Advantage

Trade theory suggests that countries do engage in trade in order to take advantage of differences among them in terms of factor endowments and technology and that the competitiveness of a country for a specific commodity is based on the concept of comparative advantage. One trade measure is Balassa Revealed Comparative Advantage (RCA) (Balassa, 1965) (Boansi and Crentsil, 2013).

On its genesis, Prasad (2004) noted that the concept of comparative advantage is widely used in economic literature to evaluate the patterns of trade and specialization of countries in commodities which they have a competitive edge and that the concept of comparative advantage based on David Ricardo (1817) is one of the oldest international trade theory. In fact, the historical development of economic thought in comparative advantage includes: the classical political economy (Smith, Ricardo, Mill), Neoclasical models (Ricardo, H-O, Ricardo-Viner, H-O Samuelson, and Salter Swan). Besides, the concept of comparative advantage stems from Ricardo's factor proportions and Heckscher-Ohlin (H-O) theories (Visser et al, 2015).

The RCA revealed the underlying comparative advantage from observable trade Patterns (Visser et al., 2015); RCA is used to explain specialization and trade patterns (Cai et al, 2009). On the difference between absolute and comparative advantage, Cai et al. (2009) noted that Absolute advantage refers to an entity's ability to produce a good or service at a lower cost per unit than the cost at which any other entity produces that good or service. Under absolute advantage, one entity can produce more output of a good or service per unit of productive input as compared to other entity, but lack comparative advantage (the determinant of specialization and trade) in the same good or service produced.

Comparative and competitive advantages are also differentiated by some authors. For instance, Thornhill (1988, cited in Cai et al., 2009), comparative advantage is an ex-ante theoretical concept involving comparisons between countries and products. Measurement of comparative advantage would ideally enable us to predict trade flows and to evaluate the extent to which the resource allocation between industries is optimum or not. Competitiveness, on the other hand, is an ex-post concept and should ideally involve comparisons between countries in regard to the efficiency of production.

Yet, on differentiating the competitive and comparative advantage, Topcu and Kilavuz (2012) noted that while competitive advantage relies heavily on firm-specific factors such as "created" factors, "created" demand for the products, and internal economies achieved through innovation; comparative advantage, on the other hand, emphasizes nationally "endowed" factors, differences

in international technology/productivity, external economies, and international policies, and that they supplements rather than substitutes in determining and sustaining a nation's advantage in international trade and business.

2.3.4 About RCA

The Revealed Comparative Advantage (RCA) index has been widely applied in different comparative export performance analysis studies dealing with specific or group of commodities/products, a country or countries and at national, sub regional, regional and global levels to assess export trade performance and competitiveness developments.

A comparative advantage measures pioneered by Liesner (1958), and polished and popularized by Balassa (1965, 1989) is the Revealed Comparative Advantage (RCA) Index. It is commonly known as Balassa Index (cited in Javed et al., 2018).

Saboniene (2009) highlighted that **t**he concept of comparative advantage is widely used in modern economic literature to evaluate the patterns of trade and specialization of countries in commodities which have a competitive advantage. Balassa (1965) suggested that export results could be used to reveal the comparative advantage of a particular country in the absence of comprehensive data on factor costs. The RCA indicates whether a country is in the process of extending the products in which it has a trade potential, as opposed to situations in which the number of products that can be competitively exported is static. It can also provide useful information about potential trade prospects with new partners. Countries with similar RCA profiles are unlikely to have high bilateral trade intensities unless intra-industry trade is involved.

Describing the components of RCA, World Bank (2011) highlighted that the RCA index is defined as the ratio of two shares. The numerator is the share of a country's total exports of the commodity of interest in its total exports. The denominator is share of world exports of the same commodity in total world exports. It takes a value between 0 and +/- 1. A country is said to have a revealed comparative advantage if the value exceeds unity. A value of less than unity implies that the country has a revealed comparative disadvantage in the product. And on the contrary, if

the index exceeds unity, the country has a revealed comparative advantage in the product (Shaiakhmetova, 2017).

The formula of RCA and description of its elements are specified as follows:

RCA = (Xij/ Xt) /(Wij/ Wj)

Where,

RCA: The competitive strength value of an export in the international market
Xij: The value of an export in the international market
Xt: The total value of a country's exports in the international market
Wij: The worldwide exports value of the commodity
Wj: The total value of world exports

On the interpretation of the resulting RCA index, Riniwati, Harahab, and Carla (2017) and Kagochi (2007) using the RCA index elaborated that if the country's RCA index value of a commodity was greater than one (RCA> 1), then the country had a comparative advantage over the world average value for the same commodity. In either way, if the value was smaller than one (RCA <1), then the comparative advantage of a country for the commodity was low. The greater the value of the RCA index of a particular commodity, the higher the level of comparative advantage would be. In the same manner, a value of less than unity implies that the country has a revealed comparative disadvantage in the product. Similarly, if the index exceeds unity, the country is said to have a revealed comparative advantage in the product (Saboniene, 2009).

A more detailed interpretation of the RCA index was also put forward by Rizwan-ul-Hassan (2013) in to a series of four classes, namely: Class a: 0< RCA index ≤ 1 [without comparative advantage]; Class b:1< RCA index ≤ 2 [weak comparative advantage]; Class c:2< RCA index ≤ 4 [medium comparative advantage]; Class d:4< RCA index [strong comparative advantage].

On its application, Irsahd and Xin (2017) discussed that RCA index can be used for commodity specific and region specific but cannot conclude the future comparative advantage.

Moreover, Cai et al. (2009) noted Revealed comparative advantage (RCA) is a method whereby comparative advantage is inferred from an ex post assessment of actual trade and specialization, and as such comparative advantage is a means of comparing relative costs and indicating the species and markets where there is the greatest likelihood of success. On the comparative advantage measures, they argued that the method can be static rather than dynamic and may not indicate long-run opportunities. However, it is a useful tool for planners who devise aquaculture strategies and for individual fish farmers. On the other hand, Siggel (2006) the RCA index measures competitiveness rather than comparative advantage.

On some of the features of RCA, Erkan and Saricoban (2014) elaborated that RCA is based on observed trade patterns. But in reality, observed trade patterns can be distorted by policies and interventions and therefore may misrepresent underlying comparative advantage. Similarly, World Bank (2011) also noted that the index is affected by anything that distorts the trade pattern, e.g., trade barriers.

This argument is also further reinforced by Siggel (2007, cited in Topcu and Kilavuz, 2012) who argued that Balassa's RCA index does not measure comparative advantage, but competitive advantage, because exports can result from subsidies (or other incentives) provided and incentives can explain competitiveness. This shows that cost comparison based on market prices cannot be the basis of competitive advantage. As also discussed in Saboniene (2009), application, when export restraints, such as general versus the nations tariffs on the same item, and national exports incentives (like subsidies) that are applied to a wide range of produced products in most countries around the world, result in biased RCA values.

Moreover, Saboniene (2009) noted that the use of RCA result could be problematic in situations when the commodities under study are a large share of total domestic export, but has a small share of total world export, and extremely high indicator values will be recorded.

2.3.5 Revealed Symmetric Comparative Advantage (RSCA) Index

While RCA has wide applications in research works, the literature also shows that the RCA index measure may show upward bias or skewedness. This problem of skewedness could be addressed and the RCA made symmetrical using the Revealed Symmetric Comparative Advantage (RSCA) index with index values ranging from -1 to +1(Javed et al., 2018; Boansi and Crentsil, 2013; Kagochi, 2007). Akhtar and et al. (2013) noted RSCA is often interpreted as an index of specialization.

Its formula is:

RSCA = (RCA - 1) / (RCA + 1)

The values of RSCA index can vary from minus one to plus one. RSCA greater than zero implies that country *i* has comparative advantage in group of products *h*. In contrast, RSCA less than zero imply that country *i* has comparative disadvantage in group of products *h* (Sachitra and Kumarasinghe, 2014). Moreover, Erkan and Sarıçoban (2014) also recommended that together with RSCA, ln version of RCA (lnRCA) can be calculated to suppress the skewness problem.

2.3.6 Regional Competitiveness

The concept of competitiveness remains arguable among scholars. Krugman (2014), for instance, by comparing firms with nations denying ability of nations to compete, and he even equalized competitiveness to mean productivity. Krugman even noted that macro-competitiveness can even be dangerous obsession. Similar to Krugman, Porter (2003) noted that the key for understanding the competitiveness is the source of national prosperity, i.e. productivity of an economy, measured by the value of its goods and services produced per unit of the nation's human, capital and national resources. Productivity is for Porter the real measurement for competitiveness.

According to Porter, a host of commercial and management factors will affect a firm's ability to compete in the international marketplace. These determinants of national competitive advantage include: factor conditions, the structure of market demand, interaction with related and supporting industries in the cluster, the determinants of firm strategy, structure, and rivalry, the

role of government, and a certain element of “chance”- these elements are visualized by Porter in a “competitiveness diamond” (Salinger, 2001).

However, in order to gain an understanding on the meaning of competitiveness, some literatures differentiate between micro (firm level), meso (regional) and macro (national) competitiveness.

As discussed in Sachitra (2014) and Borozan (2008), many indicators and composite indicators of national competitiveness have been developed and many international projects aimed to measure and compare national competitiveness have been launched. The following projects are especially popular: IMD’s World Competitiveness Yearbook, The World Economic Forum’s Global Competitiveness Report, OECD’s New Economic Report, UK Government’s Productivity and Competitiveness Indicators. The results of these studies confirm that the government can shape the favorable environment in which enterprises operate, and consequently contribute to national competitiveness. Besides, Analogous to national competitiveness, many indicators of regional competitiveness have been developed and international project have been launched, the well-known ones being: World Knowledge Competitiveness Index, European Competitiveness Index, and UK Regional Competitiveness Index by the Robert Huggins Associates, UK DTI Regional Competitiveness Index, New Economy” indices for US cities and regions compiled by The Progressive Policy Institute in Washington and Creativity index created by R. Florida.

In this respect, for example, the International Institute for Management Development defines that ‘competitiveness of nations looks how nations create and maintain an environment which sustains the competitiveness of its enterprises.” According to the Organization for Economic Cooperation and Development competitiveness is “the degree to which a nation can, under free trade and fair market conditions, produce goods and services which meet the test of international markets, while simultaneously maintaining and expanding the real incomes of its people over the long-term.” Besides, according to the European Commission (1999) definition which puts emphasis on export performance and export expansion, competitiveness is defined as: “the

ability to produce goods and services which meet the test of international markets, while at the same time maintaining high and sustainable levels of income or, more generally, the ability of (regions) to generate, while being exposed to external competition, relatively high income and employment levels."

Verman (2002) in a study of the Indian textile and garment industry export competitiveness noted that competitiveness is about productivity, which in turn is a function of factors related to cost of products, as well as those related to non-price factors such as delivery schedules, reliability of producers, and such intangible factors like image of the country/company and brand equity, and also market access conditions need to be examined as well.

On definition of regional competitiveness, on the other hand, a simplest definition defines regional competitiveness as the ability of some region to compete with one another in some way, both within and between nations, to grow and prosper in economic terms. Stoper (1997) defines regional competitiveness as: 'the capability of a region to attract and keep firms with stable or increasing market shares in an activity, while maintaining stable or increasing standards of living for those who participate in it (as cited in Sachitra, 2014).

European Central Bank Governor Mario Draghi's definition of a competitive economy is one in which "institutional and macroeconomic conditions allow productive firms to thrive and in turn, the development of these firms supports the expansion of employment, investment and trade" (Altomonte and Békés, eds., 2016a).

For example, on the European Commission's 'Regional Competitiveness Index' (RCI), as highlighted by Békés and Ottaviano (2016), specifically, "...the index is based on eleven pillars describing both inputs and outputs of territorial competitiveness, grouped into three sets describing basic, efficiency and innovative factors of competitiveness. The basic pillars represent the basic drivers of all economies. They include (1) Quality of Institutions, (2) Macro-economic Stability, (3) Infrastructure, (4) Health and the (5) Quality of Primary and Secondary Education.

These pillars are most important for less developed regions. “The efficiency pillars are (6) Higher Education and Lifelong Learning (7) Labour Market Efficiency and (8) Market Size. The innovation pillars, which are particularly important for the most advanced regional economies, include (9) Technological Readiness, (10) Business Sophistication and (11) Innovation. This group plays a more important role for intermediate and especially for highly developed regions. Overall, the RCI framework is designed to capture short- as well as long-term capabilities of the regions”. They elaborated that this notion of ‘regional competitiveness’ as a process drifts away from both the macroeconomic and the microeconomic definitions of competitiveness.

Čučković et al. (2013) in a study of regional competitiveness for Croatia identified eight competitiveness pillars, namely, demography, health and culture; education; basic infrastructure and public services; business infrastructure; investment and business dynamic; entrepreneurship; economic results-level; and economic results-dynamics.

Besides, in a study of the national export competitiveness model and the Baltic States export competitiveness index, Bruneckiene et al. (2012) considered national export competitiveness as a significant reflection of international competitiveness or the country, which affects the general country competitiveness. The study elaborated a model of national export competitiveness consisting of a diamond of factors: competitiveness of export enterprises, conditions for production, economic cooperation enhancing environment, and demand for national export.

Martin (2005) argues that no single economic theory (such as export-base theories, endogenous growth theory, cluster theories, evolutionary theory) is able to provide a generally acceptable definition of regional competitiveness. However, key determinants of regional competitiveness may be identified: productive capital, human capital, infrastructure, the competitiveness and adaptive capability of firms (for example innovation) and the interactions of all these factors.

Kitson et al. (2004) elaborated that one of the most problematic issue about regional competitiveness is that it aims to transfer a concept of competitiveness defined originally at for national levels (which is itself a debated concept) without rethinking the essential modifications

of using the same notion at a sub-national scale. For solving this problem Kitson proposed a concept of regional competitiveness that identifies six crucial components: productive capital, human capital, social-institutional capital, cultural capital, infrastructural capital and knowledge/creative capital. Yet, clarifying its differentiating features, Kitson at el. (2004) further argued that regional competitiveness focuses more on the drivers and dynamics of a region's over shares of markets and resources.

Relevant to the issue of regional competitiveness is the concept of granularity, proximity and distance (& distance decay). As discussed by Altomonte and Békés (2016b), in their study of the EU region, the idea of granularity to explore the relationship between firm-level heterogeneity and regional competitiveness. The authors argue that measuring regional competitiveness should be also based on comparing firm performance in different EU regions, rather than simply looking at average regional performance indicators.

On the importance of proximity, Békés and Ottaviano (2016) discussed how 'proximity' matters in the sense that several key interactions between people and firms that are at the core of economic performance peter out very rapidly as distance increases, making the local context the scale at which most of the action takes place. In other words, it is the importance of 'proximity' that makes 'granularity' more salient. The basic idea is that, if 'proximity' makes the regional dimension crucial and 'granularity' implies that a few large firms determine regional destinies, a natural way to assess regional performance is to look at how large firms fare across regions. They further argued that the fact that some important economic interactions are constrained by proximity is one of the reasons why the concept of 'regional competitiveness' might be worth exploring. Besides, even within a country, regions can offer rather varied business environments, including variation in labour force quality, in agglomeration and diversity of firms, in research and development infrastructure, and in urban services. Proximity matters because agglomeration externalities influence firm performance, these externalities decay fast [distance decay] with regions being close to a relevant area for most spillovers, and granularity is key, as a few large firms matter regionally more than in countries.

On granularity, Békés and Ottaviano (2016) further discussed that in most countries, a handful of firms are responsible for a large proportion of (dominant role in) economic activity, including export sales and foreign direct investment, in regional and national economic performance. Besides, granularity makes it natural for local leaders to commit public funds to attracting investment from large companies. As argued, for example, in so-called 'new economic geography' models (see eg Fujita, Krugman and Venables, 1999; or Baldwin et al, 2003) and in models of regional growth with knowledge spillovers (Ciccone and Hall, 1996), agglomeration forces, i.e., Concentration of economic activity in some regions within a country, or in some cities within a region, has been identified as a key driver of economic performance. Firms agglomerate to benefit from 'Marshallian externalities' such as the spreading of knowledge among similar industries, a greater pool of labour to choose from or the ability to access indivisible goods such as conference venues or airports. Hence, when operating within proximity of each other, firms can save on transaction costs and enjoy greater productivity. Besides, at the same time, competition between co-localised people and firms for locally scarce resources generates 'dispersion forces' that cut into the benefits of agglomeration.

An important argument put forward on the unique features of regional competitiveness looks useful. For instance, (Borozan, 2008) elaborated that regional competitiveness has been often seen in literature as a microeconomic aggregate or a macroeconomic derivate. However, the both perspectives do not provide a complete picture of regional competitiveness and for it to contribute to sustainable regional growth and prosperity. This is due to fact that each region has some unique specificities being not derived either from micro or macro-economy.

Finally, competitiveness needs, therefore, to consider both the static and dynamic environments. Thus, accordingly, World Bank (2011) noted that what matters for competitiveness is not only the capability to be productive in a static or slowly evolving external environment, but also the ability to adjust and adapt to structural changes.

2.3.7 Comparative advantage, trade performance and competitiveness indicators

In the literature, there are a number of indicators that are used for measuring comparative advantage, trade performance and competitiveness. Some of the relevant indicators include: trade openness (trade to GDP ratio), market share, growth rate, export similarity index, export complementarity index, export concentration ratios (such as Hirschman-Herfindahl (HH) Index, and Theil's Entropy measure of export concentration), Vollrath's revealed export advantage, revealed import advantage and revealed trade advantage; Balassa's RCA, RSCA, REER, nominal protection rate, real protection rate, Productivity, Unit Labour Cost, and other but vital indicators, such as non-price competitiveness, trade facilitation and logistics performance index, doing business index, etc. (ECLAC and World Bank, 2000; World Bank, 2011; Kagochi, 2007; ESCAP, 2009a; Kim, 2019; Saboniene,2009; Shaiakhmetova, 2017; Sargsyan, 2018).

2.4 Related Empirical Literature Review

The related empirical literatures included those done for specific commodities, or overall export as well as total trade (export and import) related literatures. Besides, the related literature consist of those done for a country or bilateral level, while others are done for multi country levels, such as sub regional, regional and global levels.

The empirical studies' data types covered: panel, cross sectional and time series data; while the specific data analysis method used included: gravity model analysis, OLS methods, VAR, ARDL method, trade performance indicators such as market share, shift share analysis, export competitiveness indices, such as concentration rations, RCA, RSCA, RRCA, or other trade competitiveness indicators, NPR, EPR, etc.

The empirical studies reviewed are summarized by author and title; objective, country studied and period of study; methodology and summary of results in Table 2.2.

Table 2.2: Relevant Empirical Literature on comparative Advantage & determinants of Competitiveness

S/ No.	Author & Study topic	Study objective, country studied and study period	Methodology/method	Results
1	Moyi, Eliud and Kimuyu, Peter. (1999). REVEALED COMPARATIVE ADVANTAGE AND EXPORT PROPENSITY IN KENYA	To explore factors that influence a firm' s decision to export and proportion of total production to be exported, and to identify policy interventions that can be used to improve the conditions of potential exporters. Kenya 1987-95	Analysis of the structure and composition of exports, RCA ,and propensity to export and export share (proportion of output exported) econometric analysis	RCA' s are highly concentrated in a broad group of labour intensive products. The results are consistent with the factor proportions theory as hypothesized in the Heckscher-Ohlin framework. Profit rates are correlated with firms having larger export share of production. Export promotion incentives, and mainstreaming a general improvement in the level of education and labour productivity is useful for export expansion.
2	Javed, Iqbal, Razzaq, Amar, Yasin, Mudassar, Imran, Muhammad Ali, Javaid, Haroon, Nabi, Iftikhar, Sardar, Anum and Ahmad, Shahbaz.(2018). Mutton Export Competitiveness of Pakistan	The study in hand is designed to explore the current performance and competiveness of meat industry of Pakistan and to explore the mutton exports from Pakistan and to figure out the potential markets for Pakistani mutton. Pakistan & its major to minor trading partners of (Saudi Arabia, UAE, Oman, Kuwait, Qatar, Vietnam, Malaysia, Thailand, Iran). 2005-2015, using secondary data,	Nominal protection coefficient (NPC), revealed comparative advantage (RCA) and Revealed Symmetric Comparative Advantage (RSCA) were estimated for the export of mutton to all existing international markets.	The findings categorized the destination markets into three categories of with high potential markets, low potential markets and markets with no potential.

3	Saboniene, Asta. (2009). Lithuanian Export Competitiveness: Comparison with other Baltic States, The economic conditions of enterprise functioning, ISSN 1392-2785 Inzinerine Ekonomika-Engineering Economics(2)	To present the analysis of indices which reveal comparative advantage of commodities groups of Lithuanian industry during 2001–2007 in comparison with Latvia and Estonia; to reveal the analysis of changes of export specialization. Lithuania, also compared with other small Baltic states of Latvia and Estonia. 2001-2007	Trade based modified indices of revealed comparative advantage: RCA, EC, RSCA, Net Exports RSA, ES, transformed RCA rate.	Results of RCA study reveal competitive advantage in several commodities.
4	Riniwati, Harsuko, Harahab, Nuddin, and Carla, T. Yohana. (2017). Analysis of Indonesian Crab Export Competitiveness in International Market	To know and analyze the market structure and competition of Indonesian crab, comparative advantage, competitive advantage, and crab trading specialization in international market. Indonesia 2005-2014	The analytical method used were the Concentration Ratio (CR) and Herfindahl Index (HI), revealed comparative advantage (RCA), Porter Diamond theory and Trade Specialization Index.	A high advantage of RCA value of 21.43. Furthermore, competitive advantage analysis of Porter Diamond Theory showed a high competitive strength for natural resources, demand conditions, the role of government and the role of opportunity. Next, the value of Trade Specialization Index for fresh crab and crab processed Indonesia obtained high specialization value of 0.99 and 0.97 respectively; on the other hand, frozen crab was still in its period of growth. It had 0.4 value. The values of fresh crab HI has average value of 0.103 (a low level of concentration). The values obtained from. Over the last 10 years CR8 fresh crab was an average value of 77.54 percent. CR8 ranked 8 largest state exporters of crabs in the world.
5	Kagochi, John Mwangi. (2007). EVALUATING THE COMPETITI	(For three different topics in the field of international trade and economics), to look at the competitiveness of US agricultural export	Using different economic models and techniques.	Investments in R&D influence agricultural commodity exports while the effect of human capital on agricultural commodities exports is mixed. The study demonstrate a positive relationship between successful adoption of GM technology and the projected adjustments in output and prices.

	VENESS OF US AGRICULTURAL MARKET COMMODITIES	commodities. US 1972 to 2002, 1995 and 2001, and 1972 to 2002 for the three studies, respectively		For the study on the US wheat competitiveness, results from the study find that Australia has defended its market share and maintained higher prices by differentiating its wheat through creating a perception that its wheat is of better quality. But in the longer term it is necessary for the wheat industry to maintain lower prices, and improve its quality and quality image through effective promotional campaigns.
6	Rizwan-ul-Hassan, Muhammad. (2013). An Analysis of Competitiveness of Pakistan's Agricultural Export Commodities,	To analyzes the global competitiveness of Pakistan's agricultural exports, rice, fish and fish preparations, vegetables and fruits, meat and meat preparations, vis-a-vis major Asian competitors Pakistan 2001-2010.	Using the approach of revealed comparative advantage (RCA),	The results indicate that rice exhibits very strong comparative advantage while increasing trend has been observed in all other commodities reflecting heavy potentials for export growth in global market. There is a need for Pakistan to strengthen the competitiveness in all these sectors.
7	Boansi, David and Crentsil, Christian. (2013). Competitiveness and determinants of coffee exports, producer price and production for Ethiopia	To analyze the performance of Ethiopia in export of coffee green (for the period 1961- 2010) and estimates the magnitude and effects of key economic determinants of coffee exports, producer price and production (for the period 1981-2005). Ethiopia 1961-2010 for coffee export; 1981-2005 for coffee producer price and production	RCA and RSCA measures of competitiveness, & Using three models were specified and estimated with the OLS estimator after verification of data on the respective series through the Phillips-Perron unit root test.	Export of coffee was found to increase significantly with increases in lagged domestic producer price, lagged world price to domestic producer price ratio, nominal rate of assistance, foreign direct investment and exchange rate. The intercept term had a positive and significant coefficient at the 1% level Producer price of coffee was also found to increase significantly with increases in lagged producer price, world price of coffee, exchange rate, lagged domestic consumption and lagged export of coffee. The intercept term had a negative coefficient, but was insignificant. Production of coffee green is directly proportional to yield, lagged domestic producer price, lagged world price to domestic price ratio, nominal rate of assistance, and to increases in the country's export performance for coffee (revealed symmetric comparative advantage). The intercept term had a

				positive coefficient, significant at the 1% level.
8	Akhtar, Waqar, Akmal, Nadeem, Shah, Hassnain, Niazi, Muhammad Azam and Tahir, Ayesha. (2013). EXPORT COMPETITIVENESS OF PAKISTANI HORTICULTURAL PRODUCTS,	This paper examines Pakistan's competitiveness in export of selected horticulture commodities / Fruits and vegetables Tangerines, mandarins, clem and onions/ Pakistan 1990-2009	Revealed Comparative Advantage (RCA), Relative Export Advantage Index (RXA), Revealed Symmetric Comparative Advantage (RSCA), Revealed Imports Penetration Index (RMP) and Relative Trade Advantage Index (RTA) indices.	Results indicates a transition from comparative and competitive disadvantage to comparative and competitive advantage, with the Possibility to increase competitive advantage of export to the world market.
9	Wondwosen Tebekew. (2014). A Panel Data Analysis for Bilateral Trade of Ethiopia and East African Community countries	To investigate the main determinants of Ethiopia's bilateral Trade and addresses the question of whether Ethiopia has untapped Bilateral Trade and export potentials with the East African community countries or not. Ethiopia 9 years panel data (2004-2012) of the four bilateral Trade partners	Using the econometric analysis of augmented gravity model estimation by Generalized Least Square (GLS) estimation technique.	GDP, per capita GDP difference, Nominal Exchange Rate, Inflation and Distance between the Trading Countries from Ethiopia found to have the assigned magnitude and significant impact on Ethiopia's bilateral Trade. The export potentials of the country are estimated using the estimated coefficients of the gravity model. Accordingly, Ethiopia has the highest unexploited potential in EAC and significant amount in the determining variables by the size of the bilateral economic, Nominal Exchange Rate, Trade Policy of the country and Distance between the Trading Countries and Ethiopia.

		of Ethiopia		
10	Visser, M., Pisa, N.M., Kleynhans, E.P.J. & Wait, R. (2015). Identifying the comparative advantage of products and industries of South Africa's Mpumalanga province	To determine the comparative advantage of South Africa's Mpumalanga province South Africa's Mpumalanga province 2010	By estimating the Revealed Comparative Advantage Index (RCA), and using TRADE-DSM (an international selection method that identifies and prioritizes specific target export markets and products).	RCAs are highly concentrated in labour intensive and the natural resource based industries in the province, and this provides verification of the factor proportions theory. Products with the highest comparative advantage (RCA) were identified, while using the decision support model (TRADE-DSM), 8 of the 15 products having comparative advantage, were identified to have realistic export opportunities.
11	Ismail, Djuraidin, Masbar Mohd, Raja, Syechalad, Nur, and Nasir, Muhammad. (2017). The Analysis of Competitiveness and Export Demand of Acehnese Coffee in the International Market,	(1) To identify the competitiveness of the coffee commodity from Aceh region in the international market, (2) To analyse the effects of the competitiveness on the change of export level, and (3) To analyse the factors that affect the demand for the exports of coffee in the international market. Aceh region that located in the most western part of Indonesia Secondary data of time series over a span of 22 years from 1990 to 2012.	The model used are Revealed Comparative Advantage Model (RCA), Constant Market Share Model(CMS), Partial Adjustment Model/PAM.	Using the model of partial adjustment models (PAM) with a lag of one year exports showed, both in the short and long period of time, all the variables included in the model estimates the demand function of exports significantly affect the demand for exports. The PAM Analysis of the variables that affect exports demand for Aceh coffee in the international market both in the short term and in the long term, showed lag Aceh coffee export (lag 1 year),world coffee export, world coffee prices, exchange rates and stock consumption of importing countries influence positively and significant on the exports demand of Aceh coffee, while the stock of world coffee exports and income of importing countries indicate negative and no significant impact on the export demand for Aceh coffee. Further, world tea prices have negative and significant effect on the exports demand of Aceh coffee. Analysis of the variables that affect long-term exports demand for Aceh coffee in international market showed a difference of 49.18 percent between the desired coffee exports (potential export) with exports that occurred (actual export). Aceh coffee exports in

				long term is greater than in short-term. In relations with the consumption behavior of the international community, coffee and tea products are not two substitutes that can be interchangeable.
12	Sulaiman, Amal, Baharin, Roziana, and Al-Hadi, Azrina Abdullah. (2019). IMPACT OF IMPORT AND EXPORT ON GDP OF EGYPT: APPLICATION OF ARDL MODEL	To examine the applications of Autoregressive Distributed Lag (ARDL) model in the analysis of Egypt's import and export data concerning the consequential impacts on the country's Gross Domestic Product (GDP) & to examine the current estimated import and export demand function for Egypt. Egypt 1980 to 2010	ARDL approach	The results from ARDL approach analysis agrees with the hypothesis that Egypt has a long run relationship with export, import demand, economic growth, prices of exports and imports, and volatility of an actual effective exchange rate in the market. Therefore, the imports and exports in Egypt are affected by the country's GDP. Hence it is growth driven.
13	İRHAN, H. Bayram, ALACAHAN, Nur Dilbaz, KORAP, Levent. (2011). AN EMPIRICAL MODEL FOR THE TURKISH TRADE BALANCE: NEW EVIDENCE FROM ARDL BOUNDS TESTING ANALYSES	To analyze the determinants of the Turkish trade balance are tried to be analyzed in an empirical modelling Approach to examine the existence of a long run co-integration relationship between the variables of our interest. Turkey Quarterly data 1990:Q1-2007:Q3	ARDL based bounds testing approach	The estimation results indicate that real exchange rate depreciations improves the trade balance in a strong and significant way, that domestic real income affects the trade balance negatively, and that trade balance is strongly improved due to an increase in foreign real income. No significant effect of crude oil prices can be observed on trade balance. The error correction modeling gives results in line with the long run findings of the co-integration analysis.
14	DEBEL GEMECHU. (2002).	To investigate the effect of exports on economic growth	Use of econometric methods of stationarity/unit	The results from the cointegration and error correction models revealed that export significantly affected economic growth in the short run. In addition to its

	EXPORTS AND ECONOMIC GROWTH IN ETHIOPIA: AN EMPIRICAL INVESTIGATION	Ethiopia 1960/61 to 2000/01	root test (ADF), cointegration ECM, Granger Causality Tests Using three models having growth of real GDP, gross domestic investment as % of GDP, and growth of real exports as the dependent variables, and a number of independent variables.	direct effect, export is also found to indirectly affect economic growth as evidenced from the simultaneous equation models. Furthermore, the causality test conducted indicated that causality runs from exports to economic growth and that export growth positively and significantly affected economic growth.
15	Sisay Menji. (2010). Export Performance and Determinants in Ethiopia	To reveal the performance & trend of merchandise (&manufacturing) exports and analyze the determinants of export performance, real merchandise & manufacturing exports. Ethiopia 1981 – 2008	Co integration analysis Using variables: Merchandize export volume, gross capital formation (proxy for production capacity) and share of trade in GDP (proxy for trade liberalization), terms of trade, real effective exchange rate, foreign income, and foreign direct investment.	The two models estimated depict that merchandise export volumes are significantly influenced by gross capital formation (proxy for production capacity) and share of trade in GDP (proxy for trade liberalization) while other variables; terms of trade, real effective exchange rate, foreign income, and foreign direct investment were found to be insignificant Manufacturing exports supply was found to be negatively & significantly affected by foreign income. Similar to merchandise export results, manufacturing exports were also found to be positively affected by gross capital formation. Terms of trade, real effective exchange rate, share of trade in GDP, and foreign direct investment were found to be insignificant.
16	Masmoudi, Manel, and Charfi, Faika.	To explain the role of macro-economic determinants and to evaluate the effect of	Using econometric analysis explain exports, the	The results from the regression are all significant. They show that the effect of exchange rates on exports is significantly negative which the study's theoretical line advanced. The effect of gross fixed capital

	(2013). The Macro-Economic Determinants of Export Competitiveness of the Tunisian Economy in a Context of Liberalization and Crisis.	structural factors on the export competitiveness of the Tunisian economy, in a context of liberalization and crisis. Tunisia 1980 to 2011	dependent variable, by the following explanatory or independent variables: the exchange rate, the customs duty on imports, effort investment, foreign direct investment, high tech exports, and public spending on R & D, including dummy variables.	formation, which represents the effort of domestic investment, and customs duty on imports are positive. The effect of FDI is negative. The flows of FDI inflows in Tunisia are insufficient or unable to improve the export performance of the country. The dummy variable introduced in the model on the structural change that is the free trade agreement with a significantly positive effect on exports. Thus, the liberalization policy adopted by Tunisia has a positive effect on exports. The variables related to structural competitiveness introduced in the model that is high-tech exports and public spending on research and development, have a positive effect on exports. Any increase in public spending on R & D promotes exports. The increase in the share of high-tech exports in total exports has a positive effect on increasing the level of total exports.
17	Mabeta, Joshua. (2015). Determinants of Non-Traditional Agricultural Exports Growth in Zambia: A Case of Cotton And Tobacco, Master's Thesis, Agricultural and Applied Economics, Egerton University, December, 2015	To evaluate the developmental trajectory of tobacco and cotton exports in Zambia over the last thirty-four years; To determine demand and supply factors that affect growth of tobacco and cotton exports; and To determine if there is any causality between tobacco or cotton exports and agricultural share of GDP. Zambia 1980 to 2013.	The Auto-Regressive Distributed Lagged (ARDL) model approach to co-integration	The study revealed that cotton and tobacco exports are co-integrated with foreign direct investment, real effective exchange rate, real Gross Domestic Product (GDP) of trade partners, real interest rate and world price. The ARDL analysis revealed that cotton exports are affected by the real interest rate, real effective exchange rate, world price and the real income of the trading partner in the short-run. In the long-run, cotton exports are affected by real interest rate, real effective exchange rate and real GDP. Tobacco exports are significantly affected by real effective exchange rate, real income of the trading partner and foreign direct investment in the short-run while only real effective exchange rate and the real income of the trading partner affect the growth of tobacco exports in the long-run. Granger causality tests revealed that cotton and tobacco exports granger cause agricultural share of GDP. Overall, both exports are highly elastic to exchange rate movements and the importer's GDP. There is need for government to maintain a stable exchange rate and exploit available markets through increased participation in regional integration.
18	Hailegiorgis Biramo Allaro.	To investigate empirically the trends of export performance by	Model diagnostic tests, unit root tests using	Analyses of oilseeds export performance through time divulges that the country has not yet diversified the commodity composition and structure of its export, in

	(2011). Export performance of oilseeds and its determinants in Ethiopia	analysing prices (domestic and world), real output and nominal exchange rate and examine export performance of oilseeds in Ethiopia using macroeconomic time series data. Ethiopia 1974 to 2009	Augmented Dickey Fuller (ADF), Johansen's cointegration multivariate procedure & ECM where, OlsXP refers oilseeds export performance; pd, domestic price; pw , world price; Ry, real output and e, nominal exchange rate	that its export earnings depend on only a few agricultural products. The findings of the study reveal that the country needs to break away from it's heavily depends on traditional export commodities for which it is a marginal exporter, thus a price taker. The results also show that the estimated coefficients of real output (Ry) and nominal exchange rate (e) are statistically significant. This discloses that real output and nominal exchange rate have positive brunt on the export performance of oilseeds in Ethiopia. Thus, the evidence from this study suggests that real output and nominal exchange rate significantly influence oilseeds export performance. It was also revealed that during the reform period, oilseeds export showed improvement.
19	World Bank. (2014). 3rd ETHIOPIA ECONOMIC UPDATE: STRENGTHENING EXPORT PERFORMANCE THROUGH IMPROVED COMPETITIVENESS	To discuss recent economic developments in the 'short view' and has observations on structural change in the 'long view' and looks at export performance and competitiveness Ethiopia 1996-2014 (limited durations for some of the analysis)	Utilizing key elements of the World Bank's Trade Competitiveness Diagnostic Framework	The study found out the need to:- 1. Increase value-addition, quality, and branding of exports. 2. Ease binding constraints related to reliable power supply, credit, and foreign exchange. 3. Redress bottlenecks in trade logistics. 4. Establish Industrial Zones that conform to international best practice. 5. Revise burdensome business rules that obstruct firm entry, especially high start-up capital requirement and preregistration bank deposits. 6. Improve regulatory quality, including the implementation of a pro-competition legal framework. 7. Ensure that the real exchange rate is competitive.
20	Sachitra, K.M.V. and Kumarasinghe , P.J. (2014). Dice With Death: Tea Export Competitiveness in Sri Lanka	To examine competitive position of Sri Lankan tea in the global market. Sri Lanka 2001 to 2012	Trade analysis: export growth rate, market share, major importing countries' value & market share, RCA of Sri Lanka & major tea exporters.	Sri Lanka is gradually losing competitiveness of tea export as compared to other major tea exporters. Sri Lanka now needs to prepare attack strategy and launch it aggressively in focused markets to protect tea industry.

2.5 Conceptual Framework

Based on the theoretical and empirical literature review made above, in order to analyze the export performance and also competitiveness aspects for sesame seed export from Ethiopia, the researcher will utilize the international trade and competitiveness theories and models and the different trade performance, competitiveness and potential tools, indicators and frameworks.

Accordingly, for addressing specific Objectives (1) and (2), i.e., for the descriptive analysis of export trade performance analysis, and end market analysis, the study applied trade performance and competitiveness indicators and frameworks, such as, market share, growth rate, direction of trade (concentration or dispersion), comparative analysis with competitor countries, etc. UNCTAD export potential and gap method used for estimating the export potential of sesame seed.

For assessing Ethiopia's and other African regional competitors in export of sesame seeds, RCA and RSCA indicators were used.

Reveled Comparative advantage (RCA) or Balassa Index

The RCA index, known as the Balassa index, is defined using only export data:

$$\mathbf{RCAi^A = (xi^A/X^A) / (xi^w/X^w)}$$

Where:

Xi^A – Country A exports of product i;

X^A – Total exports of country A;

Xi^w – World exports of product i;

X^w – Total world exports;

The index reveals a comparative advantage in export of commodity i by country A if the index's value is greater than one, and disadvantage if the index's value is less than one, with respect to the world or a set of reference countries (Saboniene, 2009; Irshad et al, 2018).

Revealed Symmetric Comparative Advantage (RSCA)

Nevertheless, to overcome the problem of upward biased RCA index values Laursen (1998) adjusted the RCA index to make it symmetric, that the adjusted index values were between –1 and + 1. It is defined as:

$$RSCAi^{A} = (RCAi^{A} - 1)/(RCAi^{A} + 1)$$

Positive (negative) values of RSCA show a competitive advantage (disadvantage) in exporting product j (Saboniene, 2009; Irshad et al, 2018).

For addressing specific Objective (3), the study used an ARDL time series econometric model. The study variables were:-

a/ Dependent variable specification

- Two equations, i.e., using sesame seeds export value and volume as dependent variables.

b/ Explanatory/independent variables specification

Based on the literature reviews and sesame sector challenges and opportunities, the study used current GDP of Ethiopia, Export price to producer price ratio of sesame seed, real effective exchange rate, and Import trading partners weighted GDP per capita. The conceptual framework for this research is presented as follows (See Figure 2.3).

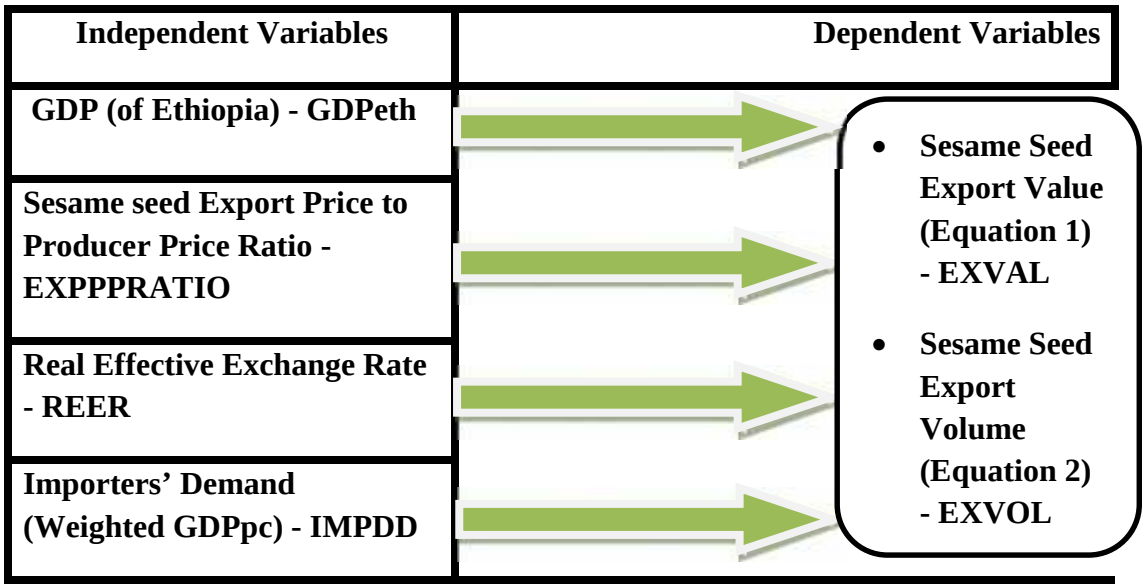


Figure 2.3: Conceptual Framework for the research (own sketch)

Dependent Variables (two equations with):

- Sesame Seeds Export Value (EXVAL), measured in thousands ('000) USD.
- Sesame Seeds Export Volume (EXVOL) measured in Tons.

Independent Variables:

GDP

GDP is the overall production value of all goods and services in an economic system or geographic area. It indicates an economy's overall capacity to supply, and hence, expand exports and reach markets globally.

Sesame seed Export price to Producer price Ratio

Export price that sesame fetches in the international market is an important factor affecting competitiveness. Export prices exceeding domestic producer prices for the commodity also show the competitiveness opportunities for the commodity. Dawit and Meijerink (2010) noted that

sesame markets in Ethiopia are highly linked with the international market and highly volatile following changes in the supply and demand in the international arena.

Sesame seed farm gate or producer price is expected to affect competitiveness, as lower prices for farmers is largely attributed to reduce the incentive to allocate labour and land to improve sesame seed production and productivity.

Real exchange rate

Exchange rate has important implication on exports. Currency devaluation likely contributes to promoting exports, while making imports relatively costly. However, it is also important for the economy to have short run export supply responsiveness to benefit from the devaluation. With recurrent devaluations in post 1991 period, observing the effect of exchange rate changes on sesame seed competitiveness becomes very important. This rate is the nominal exchange rate adjusted for the purchasing power in the country of origin and destinations of the exports.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Research Design

This study used a descriptive and explanatory design on the export performance and factor affecting the export competitiveness of Ethiopia's sesame seeds export trade. The study utilized the sesame seeds export value and volume (as two dependent variables), and GDP of Ethiopia, Export price to producer price ration, Real effective exchange rate and import trading partners demand (as represented by export share weighted major trading partners GDP per capita).

3.2 Data Type and Sources

The data used for this study was mainly time series quantitative data covering the period 1970 to 2018 period.

The major statistical data used were: Sesame seed production volume and yield, sesame seed export volume and value, national GDP, sesame seed export price (using the proxy, unit values), sesame seeds producer price, real effective exchange rate and importers' demand (as represented by export share weighted GDP per capita of major importing countries. The main sources for these data were from: FAO, UNCTAD, the World Bank, and Bruegel Institution's Economic indicators database.

3.3 Method of Analysis

3.3.1 Objective 1 (Describe and analyze Global, and in particular, African Regional competitors and Ethiopia's sesame seeds production, export trade performance and competitiveness analysis)

For objective 1, market share, export growth rates, export value and volume trends, and descriptive statistics summary of dependent and independent variables using graph and tabular forms has been used. Besides, RCA and RSCA Indices were utilized.

a) RCA and RSCA

Accordingly, Revealed Comparative Advantage (RCA), also called the Balassa RCA, suggested that comparative advantage is revealed by observing trade patterns and is derived post-trade (export) data. RCA is measured by the relative share of an industry (commodity) in a country's

total exports, divided by the industry's (commodity) relative share in total world (other country or a set of countries, e.g. the EU) exports. That is,

$$RCA^1 = \frac{X_{ij} / X_{it}}{X_{nj} / X_{nt}}$$

Where, X represents exports, i is a country, j is a commodity, t is a set of commodities, and n is a set of countries. If the value of the index exceeds unity, the country is said to have a revealed comparative advantage. If the value is less than unity, the country is said to have a comparative disadvantage in the product/industry (Havrıla and Gunawardana, 2003, cited in Topcu and Kilavuz, 2012). On the other hand, regarding RSCA, RSCA measures RCA-1/RCA+1, with its value ranging from -1 to 1 (Javed et al., 2018).

3.3.2 Objective 2 (Analyze end-markets (destination markets), geographic concentration/ dispersion of exports, related trade performance indicators, and comparative advantage (using RCA & RSCA) of Ethiopia and the major African Regional Competitors).

Apart from market shares (%), the direction of trade statistics was analyzed further based to review the geographic concentration or dispersion of sesame seeds export from the African region competitor countries, and also from Ethiopia, to the international market.

The geographic concentration/dispersion index, specifically, the Hirschman-Herfindahl (HH) geographic concentration index has been used, based on UNCTAD database. The Hirschman-Herfindahl (HH) Index can be used to estimate export concentration (or diversification).

The concentration is based on the Herfindahl index. It is calculated by squaring the share of each country in the selected market and by summing the resulting numbers

$$H = \sum_{i=1}^{N} s_i^2$$

where s_i is the share of the country i in the market, and N is the number of countries. The Herfindahl Index (H) ranges from $1 / N$ to one. For instance, US federal authorities consider

Herfindahl indices between 0.1000 and 0.1800 to be moderately concentrated and indices above 0.1800 to be concentrated (UNCTAD, 2019).

3.3.3 Objective 3 (Explain the factors affecting Ethiopia's sesame seeds export trade performance and competitiveness (using ARDL model, multivariate econometric method).

For the analysis, descriptive statistics such as the mean, standard deviation and the median, correlation analysis (to ascertain the nature of the relationship among the variables), including use of graphical presentation wherever necessary.

Trend Analysis

Besides, to ascertain the linear nature of the trend of sesame seed export and also value, sesame seed export and also value were regressed on time, with a positive coefficient showing upward trend. The growth rate model used is presented as follows:

$$LnEXVAL = ß_1 + ß_2t + u_t$$

$$LnEXVOL = ß_1 + ß_2t + u_t$$

in which LnEXVAL is the sesame seed export value of Ethiopia and LnEXVOL is the sesame seed export volume, each in log form; $ß_1$ is the intercept, *t* is trending variable, $ß_2$ is the slope coefficient (which can take positive or negative value) and u_t is error term.

This is a semi-log or log-lin model as only one variable (EXVAL or EXVAL) takes on a logarithmic form. The equation measure the proportional (relative) change in EXVAL or EXVOL (the regressand) for a given absolute change in the value of the regressor, t. That is, it shows the rate of growth for a point in time, where: $ß_2 = d(lnY)/dX$.

In order to analyze the export performance of Ethiopia and the African Region, the leading global producers of sesame seed was analyzed, based on which the leading eight major sesame seed producing countries (including Ethiopia) were identified and ranked (based on volume of their sesame seed production measured in tons). The export performance of Ethiopia has also been analyzed further in terms of export volume, value, and production yield in graphs.

Besides, export performance of Ethiopia and the major regional competing countries were further analyzed in terms of end market developments and trends, which as to which specific markets the regional competing countries export and how does the end market developments behave, in terms of market growth, stagnation, or decline; and also distance of the African regional exporting countries from their respective destination markets.

Auto-Regressive Distributed Lagged (ARDL) model

In order to analyze/determine the (demand and supply side) factors affecting sesame seed export performance and competitiveness of Ethiopia, the study used the Auto-Regressive Distributed Lagged (ARDL) model approach.

As discussed in Sulaiman Baharin, and Al-Hadi (2019), the ARDL approach was majorly popularized by Pesaran between 1997 and 2001 due to its numerous advantages (Pesaran, 1997) The primary advantage of ARDL model is the fact that it can be applied irrespective of (0) or I (1) variables (Oskooee and Oyolola, 2007). The second advantage of this model is that it can take a wide range of numbers of lags that are captured in the data generating process especially in a more general-to-specific approach of ARDL modeling framework (McCann et al., 2010). On top of that, the Dynamic Error Correction Model (ECM) can be generated from the ARDL by applying a simple linear transformation. Furthermore, economists have commonly recommended the use of ADRL because the model minimizes mistakes and random errors that may be experienced due to non-stationary series data.

$EXVAL_{tj} = f(GDPeth_t, EXPPPRATIO_t, REER_t, IMPDD_t)$ ……. (1)

$EXVOL_{tj} = f(GDPeth_t, EXPPPRATIO_t, REER_t, IMPDD_t)$

The specification of the regression model was as follows:

$EXVAL_t = \alpha + ß_1\, GDPeth_t + ß_2 EXPPPRATIO_t + ß_3 REER_t + ß_4 IMPDD_t + u_t$ …….. (2)

$EXVOL_t = \alpha + ß_1\, GDPeth_t + ß_2 EXPPPRATIO_t + ß_3 REER_t + ß_4 IMPDD_t + u_t$

Where:

$EXVAL_t$ = sesame seed export value of Ethiopia in '000USD at time t, t= 1, ……..n

$EXVOL_t$ = sesame seed export volume of Ethiopia in tons at time t, t= 1, ……..n

$EXPPPRATIO_t$= Export price to producer price ratio at time t, t= 1, ……..n

$REER_t$= Real Effective Exchange Rate of Ethiopia, against major trading partners at time t, t= 1, ……..n

$IMPDD_t$=Major Importing Countries export trade share weighted GDPpc at time t, t= 1, ……..n

u_t = error term ; α = intercept term.

ARDL Model Representation

ARDL(p, q, . . . , q) model:

$$y_t = c_0 + c_1 t + \sum_{i=1}^{p} \phi_i y_{t-i} + \sum_{i=0}^{q} \beta_i' x_{t-i} + u_t,$$

t = max(p, q), . . . , T, for simplicity assuming that the lag order q is the same for all variables in the K × 1 vector xt. The variables in (yt, xt′)′ are allowed to be purely I(0), purely I(1), or cointegrated (Pesaran, Shin, and Smith, 2001, as cited in Kripfganz and Schneider, 2016). The optimal lag orders p and q (possibly different across regressors) can be obtained my minimizing a model selection criterion, e.g. the Akaike information criterion (AIC) or the Bayesian information criterion (BIC) (Kripfganz and Schneider, 2016).

The concept of stationarity

Most time series data are non-stationary at level. It means that their mean, variance and covariance are not constant over time. The regression of a non-stationary time series on another non-stationary time series may produce spurious regression results. Stochastic and deterministic

trends (which have unit roots) can be made stationary by differencing and regressing on time respectively. Taking the first difference is shown by: $\Delta Y_t = Y_t - Y_{t-1} = \mu_t$ (Maadala, 1992).

Besides, Hill and Lim (2011) elaborated that when nonstationary time series are used in a regression model, the results may spuriously indicate a significant relationship when there is none. In these cases the least squares estimator and least squares predictor do not have their usual properties, and t-statistics are not reliable. Since many macroeconomic time series are nonstationary, it is particularly important to take care when estimating regressions with macroeconomic variables.

Why we do unit roots test?

The characteristic of a time series has a far reaching implication for economic and policy formulation and implementation. When a series has a unit root *(p1 =0),* any shock to the data series is long lasting. Hence, there will be a cumulative divergence from the mean/trend of the series. The instability exhibited by this series will tend to render any policy formulated and implemented on the basis of a model estimated using such data series inefficient. This is because what drives any policy formulation and implementation is the clear assumption of the stability of the series. Nkoro and Uko (2016)

To test stationarity of the time series variables, the Augmented Dickey-Fuller Test as used. As per Nkoro and Uko (2016) the Augmented Dickey-Fuller (ADF) test is considered superior because of its popularity and wide application. The ADF test adjusts the DF test to take care of possible autocorrelation in the error terms by adding the lagged difference term of the dependent variable.

The concept of co-integration and its application procedures:

On the concept of co-integration, Nkoro and Uke highlighted that modeling time series in order to keep their long-run information intact can be done through cointegration. Cointegration is an econometric concept that mimics the existence of a long-run equilibrium among underlying economic time series that converges over time. Thus, cointegration establishes a stronger

statistical and economic basis for empirical error correction model, which brings together short and long-run information in modeling variables. Testing for cointegration is a necessary step to establish if a model empirically exhibits meaningful long run relationships. This cointegration testing procedure specifically helps us to know whether the underlying variables in the model are cointegrated or not, given the endogenous variable.

Thus, if two series, y_t and x_t , are integrated of the same order, that is, y_t ~I(1) and x_t ~I(1), then y_t and x_t are said to be cointegrated if there exists a β such that y_t - βx_t is I(0). This is denoted by saying y_t and x_t are CI (1, l). This means that y_t and x_t in the regression equation ($y_t - \beta x_t + e_t$) do not drift too far apart from each other overtime. There is a long-run equilibrium relationship between the two variables, that is, the series move together over time or I (0).

Besides, ARDL cointegration technique is adopted irrespective of whether the underlying variables are I(0), I(1) or a combination of both, and cannot be applied when the underlying variables are integrated of order I(2). However, to avoid crashing of the ARDL technique and, effort in futility, it is advisable to tests for unit roots since variables that are integration of order I(2) leads to the crashing of the technique (Nkoro and Uko, 2016).

Traditional cointegration methodologies of Engle-Granger (1987), Phillips and Ouliaris (1990) or Johansen (1995), typically fail since all variables need to have identical orders of integration, usually I(1)(ARDL models are linear time series models in which both the dependent and independent variables are related not only contemporaneously, but across historical (lagged) values as well. ARDL models are de facto the standard of estimation when one chooses to remain agnostic about the orders of integration of the underlying variables. It is precisely in this regard where the ARDL methodology shines (Eviews, www.eviews.com**).**

Cointegration is a powerful way of detecting the presence of long-run relationships or steady-state equilibrium between variables. Different cointegration techniques were developed to determine the long-run relationships between the time series. In all these cointegration techniques, the most important restriction is that all the series must be of the same ordered

integrations. However, a recently developed cointegration approach, namely the autoregressive-distributed lag (ARDL), also known as the bounds test, eliminates this restriction. The ARDL approach allows the regressors to be stationary in levels (I (0)) or the first-differenced (I (1)). Owing to this convenience, the ARDL method has been used in many empirical works (Dube, Ozkan and Govindasamy, 2018). The ARDL bound test for co-integration is also the one used in this study.

As elaborated in Kripfganz and Schneider (2016), Engle and Granger (1987) two-step approach for testing the existence of a long-run relationship, while Pesaran and Shin (1998) suggest obtaining the long-run parameters from an ARDL model. On bounds procedure for testing the existence of a long-run relationship based on the EC representation of the ARDL model. Pesaran, Shin, and Smith (2001) tabulate asymptotic critical values that span a band from all regressors being purely *I*(0) to all regressors being purely *I*(1). Narayan (2005) computes corresponding small-sample critical values for various sample sizes.

Here, the F test was used to test the null hypothesis that all beta coefficients are jointly equal to zero. The statistical testing on whether or not there is co-integration is made based on the lower and upper bound F-values provided by Pesaran *et al.* (2001). Accordingly, if the computed F value is less than the F-value for the lower bound, then the null hypothesis cannot be rejected. If the computed F-value exceeds the F-value for the upper bound, then the null hypothesis of no co-integration is rejected, otherwise the test is inconclusive.

In order to test for the presence of co-integration among the variables, the ARDL bounds testing procedure was used by modeling the basic equation (equation 1 and 2).

Accordingly, an ARDL model specification for this study becomes:

Equation 1, with EXVAL as Y_1:

$$EXVAL_t = a_{01} + b_{11}\log EXVAL_{t-1} + b_{21}\log GDPeth_{t-1} + b_{31}\log EXPPPRATIO_{t-1} + b_{41}\log REER_{t-1} + b_{51}\log IMPDD_{t-1} + \sum_{i=1}^{p} a_{1i}\Delta\log EXVAL_{t-1} + \sum_{i=01}^{q} a_{2i}\Delta\log GDPeth_{t-1} + \sum_{i=01}^{q} a_{3i}\Delta\log EXPPPRATIO_{t-1} + \sum_{i=01}^{q} a_{4i}\Delta\log REER_{t-1} + \sum_{i=01}^{q} a_{5i}\Delta\log IMPDD_{t-1} + \varepsilon_t \quad \text{Equation (1)}$$

Equation 2, with EXVOL as Y_2:

$$EXVOL_t = a_{02} + \boldsymbol{b_{11}}\log EXVOL_{t-1} + b_{21}\log GDPeth_{t-1} + b_{31}\log EXPPPRATIO_{t-1} + b_{41}\log REER_{t-1} + b_{51}\log IMPDD_{t-1} + \sum_{i=1}^{p} a_{1i}\Delta\log EXVOL_{t-1} + \sum_{i=01}^{q} a_{2i}\Delta\log GDPeth_{t-1} + \sum_{i=01}^{q} a_{3i}\Delta\log EXPPPRATIO_{t-1} + \sum_{i=01}^{q} a_{4i}\Delta\log REER_{t-1} + \sum_{i=01}^{q} a_{5i}\Delta\log IMPDD_{t-1} + \varepsilon_t \text{ --- Equation (2)}$$

In such a specification while the beta coefficients show long run estimates, the terms with the difference operator show short run dynamics. If there is co-integration among the variables, then the short-run dynamics can be described by the Error Correction Model (ECM) (Maddala, 1992).

The ARDL model reparameterized into ECM gives the short-run dynamics and long run relationship of the underlying variables. With the specification of ECM, we now have both long-run and short-run information incorporated (Nkoro and Uko, 2016). Besides, Gujarati (2004) noted that the error correction mechanism (ECM) first used by Sargan and later popularized by Engle and Granger corrects for disequilibrium. An important theorem, known as the Granger representation theorem, states that if two variables *Y* and *X* are cointegrated, then the relationship between the two can be expressed as ECM.

Kripfganz and Schneider (2016) specified the ECM representation as follows.

Reparameterization in conditional EC form:

$$\Delta y_t = c_0 + c_1 t - \alpha(y_{t-1} - \boldsymbol{\theta}\mathbf{x}_{t-1}) + \sum_{i=1}^{p-1} \psi_{yi}\Delta y_{t-i} + \omega'\Delta\mathbf{x}_t + \sum_{i=1}^{q-1} \psi'_{xi}\Delta\mathbf{x}_{t-i} + u_t,$$

with the speed-of-adjustment coefficient $\alpha = 1 - \sum_{j=1}^{p} \phi_j$ and the long-run coefficients $\boldsymbol{\theta} = \frac{\sum_{j=0}^{q} \beta_j}{\alpha}$.

Alternative EC parameterization:

$$\Delta y_t = c_0 + c_1 t - \alpha(y_{t-1} - \boldsymbol{\theta}\mathbf{x}_t) + \sum_{i=1}^{p-1} \psi_{yi}\Delta y_{t-i} + \sum_{i=0}^{q-1} \psi'_{xi}\Delta\mathbf{x}_{t-i} + u_t.$$

The short run model to be estimated if there is no co integration is:

$$EXVAL_t = a_{01} + \sum_{i=1}^{p} a_1 \Delta \log EXVAL_{t-1} + \sum_{i=01}^{q} a_{2i} \Delta \log GDPeth_{t-1} + \sum_{i=01}^{q} a_{3i} \Delta \log EXPPPRATIO_{t-1} + \sum_{i=01}^{q} a_{4i} \Delta \log REER_{t-1} + \sum_{i=01}^{q} a_{5i} \Delta \log IMPDD_{t-i} + \varepsilon_t$$ ---------- Equation (1)

$$EXVOL_t = a_{02} + \sum_{i=1}^{p} a_1 \Delta \log EXVOL_{t-1} + \sum_{i=01}^{q} a_{2i} \Delta \log GDPeth_{t-1} + \sum_{i=01}^{q} a_{3i} \Delta \log EXPPPRATIO_{t-1} + \sum_{i=01}^{q} a_{4i} \Delta \log REER_{t-1} + \sum_{i=01}^{q} a_{5i} \Delta \log IMPDD_{t-i} + \varepsilon_t$$ ---------- Equation (2)

However, if there is co integration ECM (Error Correction Model) with, $\boldsymbol{\lambda}$ representing the speed of adjustment to an equilibrium situation, is specified.

ECM specification of the model used in this study becomes

$$EXVAL_t = a_{01} + \sum_{i=1}^{p} a_1 \Delta \log EXVAL_{t-1} + \sum_{i=01}^{q} a_{2i} \Delta \log GDPeth_{t-1} + \sum_{i=01}^{q} a_{3i} \Delta \log EXPPPRATIO_{t-1} + \sum_{i=01}^{q} a_{4i} \Delta \log REER_{t-1} + \sum_{i=01}^{q} a_{5i} \Delta \log IMPDD_{t-i} + \boldsymbol{\lambda ECTt\text{-}1} + \varepsilon_t$$ ---------- Equation (1)

$$EXVOL_t = a_{02} + \sum_{i=1}^{p} a_1 \Delta \log EXVOL_{t-1} + \sum_{i=01}^{q} a_{2i} \Delta \log GDPeth_{t-1} + \sum_{i=01}^{q} a_{3i} \Delta \log EXPPPRATIO_{t-1} + \sum_{i=01}^{q} a_{4i} \Delta \log REER_{t-1} + \sum_{i=01}^{q} a_{5i} \Delta \log IMPDD_{t-1} + \boldsymbol{\lambda ECTt\text{-}1} + \varepsilon_t$$ ---------- Equation (2)

The coefficient of the ECM shows the speed of adjustment of a parameter, indicating how quickly the series can come back to its long-run equilibrium and the sign of the coefficient must be negative and significant (Dube, Ozkan and Govindasamy (2018).

On the interpretation of the Error Correction (EC) terms, it is elaborated that the term ECt is the speed of adjustment parameter or feedback effect. The ECt shows how much of the disequilibrium is being corrected, that is, the extent to which any disequilibrium in the previous period is being adjusted in *yt*. A positive coefficient indicates a divergence, while a negative coefficient indicates convergence. If the estimate of ECt = 1, then 100% of the adjustment takes place within the period, or the adjustment is instantaneous and full, if the estimate of ECt = 0.5, then 50% of the adjustment takes place each period/year. ECt = 0, shows that there is no adjustment, and to claim that there is a long-run relationship does not make sense any more. Nkoro and Uko (2016).

On Granger Causality:

Granger is premised on the idea that the future cannot cause the present or the past. If event *B* occurs before event *A*, it means *A* cannot cause *B*. The converse is also true. However, it does not necessarily imply that if *A* occurs before *B* then *A* causes *B*. Causality in its real sense simply identifies which event precedes the other. Since these two events are observable phenomena, the main task is just to identify which of the two precedes the other or if they are contemporaneous (Maddala, 1992).

The null hypothesis Granger Causality test becomes, the independent variable, say, GDP, Export to Producer Price ratio, Import Demand or REER, does not granger cause sesame seed exports. The null hypothesis is rejected if the computed F-statistic is significant at 5 percent level of significance.

3.3.3.1 Variables and expected signs

a) Exports (as represented by EXVAL)

The dependent variable used for this study is represented by Sesame Seed Export Value (denoted by EXVA, in million USD).

b) Exports (as represented by EXVOL)

Another dependent variable used in this study is Sesame Seed Export Volume (denoted by EXVOL, in tons).

c) GDP of Ethiopia (GDPeth)

A country's GDP measures the total value of goods and services produced within the boundary/territory of a country. It also shows the capacity of the economy to produce and supply both locally and for international markets.

d) Import Demand/Importing countries' GDP per capita (IMPDD)

To represent import demand, based on a ten year average of detailed export data, the export trade share weighted GDP per capita of the top 12 major importing countries accounting for 95.23% of the export of sesame seed from Ethiopia has been used. An increase in importers income (as represented by their GDP per capita) is expected to increase the demand for sesame seed exports.

e) Real Effective Exchange Rate (REER)

Real effective exchange rate (REER) is the trade-weighted exchange rate against major trading partners and is computed as a product of nominal effective exchange rate and ratio of domestic and foreign consumer price index. Due to lack of complete series of relevant data, the REER used is the country REER time series database maintained by Brugel international institution, where an increase in REERI and NEERI indicates appreciation and vice versa.

As discussed in Kagochi (2007), the Real Exchange Rate (*RER*) is a measure of competitiveness generally applied to the entire economy but increasingly employed for specific sectors. If REER depreciates over the desired time period, it indicates that an improvement in a country's international competitiveness. Also, Benkovskis and Wörz (2013) discussed that increases reflect real appreciation, so they are associated with losses of international competitiveness.

World Bank (2011) elaborated that the real exchange rate also plays an important role in countries' export competitiveness, and that the emphasis should be on the real exchange rate rather than the nominal rate because what matters for private-sector profitability is the ratio of unit price over unit costs. In general, exchange rate policy should target the (hypothetical) equilibrium real exchange rate, which should reflect long-run fundamentals of the country, in terms of relative prices in domestic markets. An overvaluation of the real exchange rate makes exporters' goods expensive in foreign markets exchange rate depreciation to bring the real exchange rate closer to equilibrium (driven by the relative productivity of the economy) would stimulate exports and curtail imports, while exchange rate appreciation would be detrimental to exports and encourage imports. Besides, those sectors with high import content tend to benefit while others tend to suffer from currency real appreciation. Thus, directed policies to support

either an overvalued or undervalued exchange can impact relative competitiveness. Both can be detrimental over the long term.

f) Export (international price) to Producer Price Ratio

Export price is considered a major indicator of international competitiveness and shows the return to exporters. On the other hand, producer price is the price received by the producers/farmers of sesame seed locally. Here, combining the two prices, a ratio indicator is used. Thus, the higher the ratio of export price to producer price, the better competitive the country's export commodity is. Thus, exporters will be expected to supply more to the international market, thus showing a positive expected relationship of export to producer price ratio and exports. ['Export price to Producer price ratio' was also used by Boansi and Crentsil (2013) in their study on 'Competitiveness and determinants of coffee exports, producer price and production for Ethiopia'].

The description of the variables and expected signs is presented in Table 3.1.

Table 3.1: Variables and expected signs

Variable	Variable name	Measurement	Expected sign
EXVAL (Y_1)	Sesame Seed Export Value	Sesame seed export value (in '000 USD)	
EXVOL (Y_2)	Sesame Seed Export Volume	Sesame seed export volume (in Tons)	
GDPeth ($X_{1)}$	Gross Domestic Product of Ethiopia	GDP (in million USD)	+
EXPPPRATIO (X_2)	Export price/Producer price ratio	International price to Producer price of sesame seeds ratio	+

REER (X_3)	Real effective exchange rate	Trade weighted and CPI-based exchange rate between the Eth. Birr against currencies of major trading partners	**-/+ Appreciation/ Depreciation**
IMPDD (Importers Demand) (X_4)	Importer GDP per capita	Export trade-weighted GDP per capita of importers of sesame seed (million USD)	+

3.3.4 Objective 4 (Assess Ethiopia's sesame seeds export potentials in major import trading partners/destination markets globally).

3.3.4.1 Export Potential Methodology

In the literature, there are different approaches to estimating export potentials, such as those based on gravity model, potential bilateral trade index, among others. The method used in this study is the export potential analysis approach of UNCTAD.

3.3.4.2 The UNCTAD methodology of export potential and gap

In order to obtain relevant export potential results for Ethiopia, the UNCTAD/ITC trade data based model and indicator for a given product and target market has been used, which combines the exporter's supply with the target market's demand (based on historical export performance data), market access conditions and the bilateral links between the two countries.

Potential export value of product k supplied by country i to market j, in dollars, is calculated as supply (based on a projected market share) × demand (corrected for market access) × bilateral ease of trade. Supply and demand are projected into the future based on GDP and population forecasts, demand elasticities and forward-looking tariffs. The estimated dollar value serves as a benchmark for comparison with actual exports and should not be interpreted as a ceiling value. In reality, the actual trade value may be below or above the potential value (UNCTAD, 2020). (See further on the methodology adopted in **Inbox 3.1).**

The methodological approach used by UNCTAD was further elaborated by Decreux and Spies (2016) as follows:

Export Potential indicator

The methodology to estimate export potential is inspired by a gravity model specified at the product level. The starting point is the assumption that in a world without frictions, trade flows could be described by a combination of exporter × product, importer × product and exporter × importer factors,

$$v_{ijk} = \alpha_{ik}\beta_{ij}\gamma_{jk} \quad (1)$$

where v_{ijk} corresponds to exports from exporter i of product k to market j. The parameter α_{ik} describes exporter i's performance in exporting product k, γ_{jk} market reflects j's demand for product k and β_{ij} the easiness to export any good from i to j.

Export potential value and unrealized export potential

The export potential value follows directly from the combination of supply, demand and easiness to trade factors,

$$EP_{ijk} = Supply_{ik}^{EP} \times Easiness_{ij} \times Demand_{ijk}$$

A normalisation (to make market shares sum up to 1) is done to ensures that summation over i results in $EPjk = Projected\ vjk$. The comparison of potential export values with actual export values allows revealing untapped opportunities that trade support institutions can address. The extent to which there remains unrealized export potential in a specific product or target market is calculated as

$$Unrealized\ potential_{ijk} = EP_{ijk} - \min(v_{ijk}, EP_{ijk})$$

In case of $vijk > EPijk$, the unrealized potential equals zero.

Measuring export potential

SUPPLY (EP)

The supply side in the export potential indicator is based on the projected market share. As a result, the share of country i's exports of product k in total exports of product k, multiplied by the exporter's expected GDP growth rate (relative to expected GDP growth of other exporters of the same product) capture the relative increase in overall supply performance. This indicator is corrected for global tariff advantages of country i in product k: it is meant to capture projected market share, and thus supply performance, in the absence of tariffs (the impact of tariffs on exports to a particular market will be taken into account in the demand component). A filter to remove re-exported products is applied in certain manufacturing sectors.

DEMAND

The demand component is based on projected imports, thus market j's imports of product k, augmented by expected growth of GDP per capita (subject to estimated revenue elasticities of import demand per capita at sector and development level). The indicator also considers the future tariff advantage in the target market and the bilateral distance as compared to the average distance over which the target market usually imports the product.

EASE OF TRADE

Ease of trade is based on the ratio of actual trade between exporter i and market j for products with potential relative to their hypothetical trade if exporter i had the same share in market j as it has in world markets. The numerator captures the actual trade between the exporter i and market j and the denominator captures trade complementarities between the exporter i and market j. If Ease > 1, country i finds it easier to trade with market j than with world markets on average, augmenting the potential to trade any product with market j. This can reflect in a high numerator, resulting for instance from the two countries being located in proximity, sharing the same language or culture or having established commercial links in the past. It can also reflect in a low denominator due to a limited complementarity of the countries' export and import baskets. By contrast, if Ease < 1, country i finds it relatively more difficult to trade with market j, lowering its potential to trade with that market across all products (UNCTAD).

Inbox 3.1: Measuring export potential

3.4 Ethical Considerations

Researchers need to protect their research participants; develop a trust with them; promote the integrity of research; guard against misconduct and impropriety that might reflect on their organizations or institutions; and cope with new, challenging problems. Ethical questions are apparent today in such issues as personal disclosure, authenticity and credibility of the research report, the role of researchers in cross-cultural contexts, and issues of personal privacy through forms of Internet data collection (Isreal & Hay, 2006, in Creswell, 2009).

The researcher collected letter of consent from the RLDS Department of AAU to facilitate the collection of primary and secondary quantitative and qualitative data and presented this official letter whenever communicating with respondent groups and institutions and their representatives. Besides, the researcher made utmost effort to adhere to maintaining high level of ethical standard in the conduct of the research activity from the research proposal development to data collection, analysis and interpretation, and the thesis write-up.

CHAPTER FOUR: RESULTS

4.1 Objective 1: Describe and analyze Global, and in particular, African Regional competitors and Ethiopia's sesame seeds production, export trade performance and competitiveness analysis

4.1.1 Production of Sesame Seeds the World, Africa and Ethiopia

4.1.1.1 Global and African Region Sesame Seed production

The presence of conducive agroecology to carryout agricultural production is an important precondition for the production and export of most agricultural commodities in the global marketplace. The world major producers of sesame seed are analyzed in Table 4.1 below.

Table 4.1: Leading global producers of Sesame Seed

Country	Average production (2014-18) in tons
United Republic of Tanzania	858,218
Myanmar	795,200
India	785,200
Sudan	667,400
Nigeria	488,130
China, mainland	445,880
Ethiopia	**278,629**
Burkina Faso	227,712
South Sudan	195,691
Chad	168,467
Uganda	142,196

Source: computed using FAO data

Tanzania, Myanmar, India, Sudan, Nigeria as well as China are the world leading producers of sesame seed. Accordingly, Ethiopia is one of the major global and African regional producers of sesame seed, taking 7th and 4th ranks respectively, based on the 5 year average for the period 2014-2018.

4.1.1.2 Ethiopia

Ethiopia's sesame seed are harvested has generally been rising, despite erratic increases and decreases, over the 1970-2018 period, reaching 400,000 ha in 2018. Sesame seed yield has been showing periods of increasing and decreasing trends and stagnant for some years over the 1970-2018 period, i.e., from a low of 4 quintals per hectare to a high of 10 quintals per ha, though by 2018 the yield rate stands at below 8 quintals per ha. On the other hand, sesame seed production has shown upward trends with erratic increase and decreases in recent years, reaching its peak of 327,741 in 2010, and standing at 301,302 tons in 2018. See Figure 4.1.

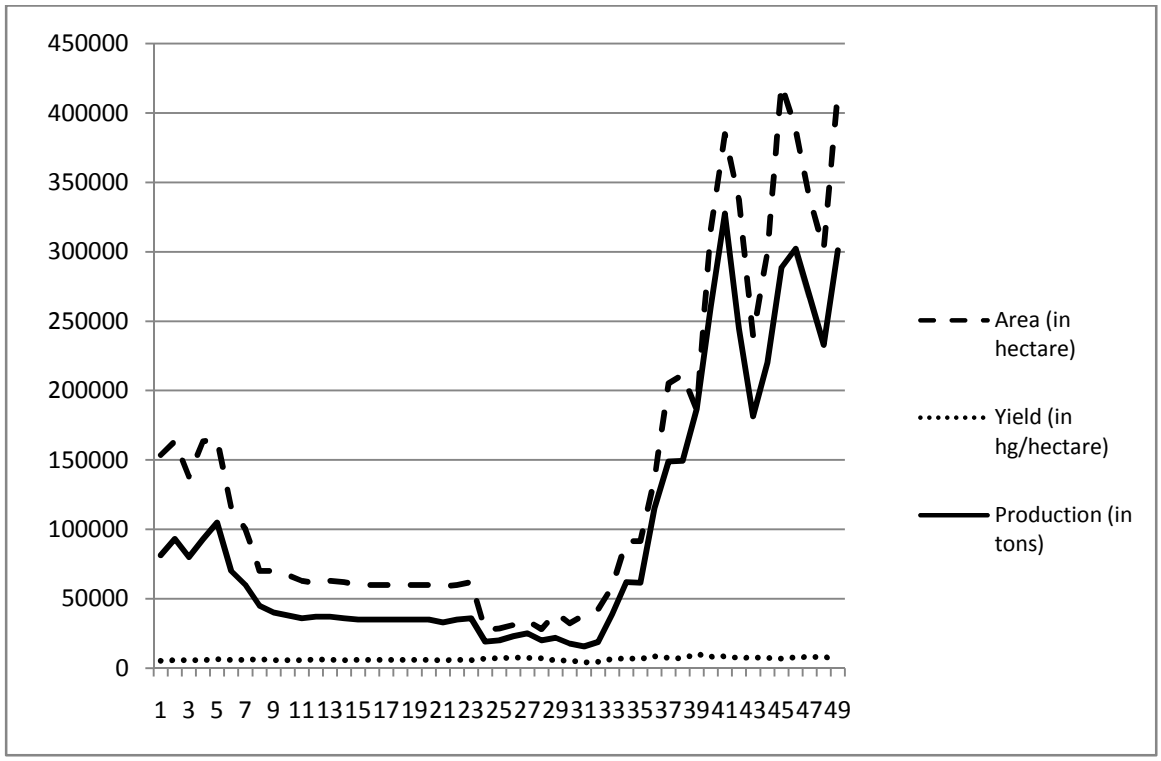


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Figure 4.1: Ethiopia's Sesame Seed Area, Yield and Production (1970-2018)
Source: computed using FAO data

4.1.2 Global and African Region Sesame Seeds export

Based on the UNCTAD ITC data for 2018, for which complete country data series are available, the leading exporters of sesame seed in Africa (with a 1% share or more of export quantity) are: Sudan, Ethiopia, Nigeria, Burkina Faso, Tanzania, Chad and Uganda, though Togo, not a major exporter, also recorded a drastic increase in exports in 2018. Ethiopia ranks as the second leading sesame seed exporter from Africa, in terms of volume of exports, with 11.4% share, next to Sudan (21.8%). Ethiopia is followed by Nigeria, as the third sesame seed exporting country from Africa, with 10.6% share. As further analyzed in Table 4.2, Africa's share of world sesame seed export volume is nearly 65.5%.

Table 4.2: Major exporter of sesame seeds from the African Region

Exporters	Export Quantity (in tons)	**2018 (in %)**
World	2,129,555	**100.0**
Africa Aggregation	1,394,390	**65.5**
Sudan	464,378	**21.8**
Ethiopia	243,676	**11.4**
Nigeria	225,086	**10.6**
Burkina Faso	163,559	**7.7**
Togo	104,587	**4.9**
Tanzania	66,480	**3.1**
Chad	22,038	**1.0**
Uganda	21,192	**1.0**
Mali	21,056	**1.0**

Source: using UNCTAD data

4.1.3 Ethiopia's Sesame Seed Export – time series data (1970-2018)

Based on FAO trade statistics, Ethiopia's sesame seed export has in general passed through a very slow and at times stagnant situation to a fast rising growth trend during the period 1970 to 2018.

During the 1970-2018 period, the share of sesame seed in total oilseed export value has rising, reaching more than 80% share, though with erratic movements during intervening years related to series of civil war and natural disasters in the country, and esp. in the predominantly sesame seed growing areas. (See Figure 4.2)

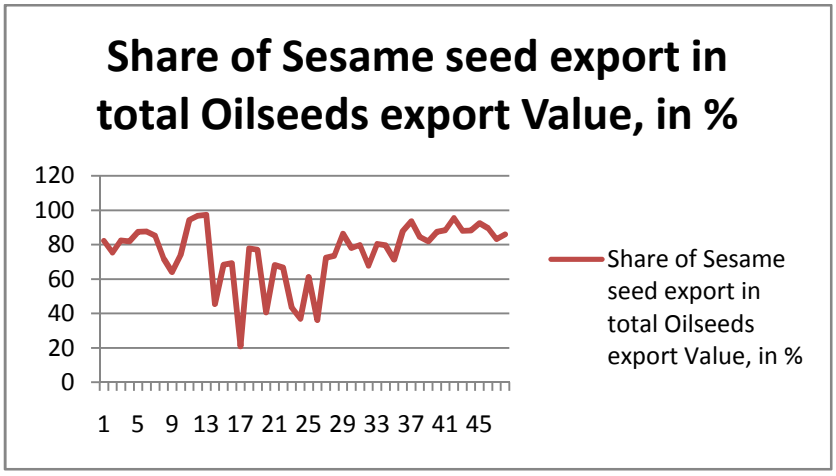

Figure 4.2: Share of Sesame seed in total oilseed crops export value (%)
Source: computed based on FAO data

4.2 Objective 2: Analyze end-markets (destination markets), geographic concentration/dispersion of sesame seed exports, related trade performance indicators, and comparative advantage (using RCA & RSCA) of Ethiopia and the major African Regional Competitors,

4.2.1 Ethiopia's export of sesame seed by destination further analysis for 2018

In 2018, Ethiopia's share of world sesame seeds export value and volume was 12.0% and 11.4% respectively. See Table 4.3 and 4.4.

Table 4.3: Ethiopia's share of World Sesame Seeds Export Value

Exporters	Exported value in 2014	Exported value in 2015	Exported value in 2016	Exported value in 2017	Exported value in 2018
World	3885321	3282507	2196748	2189361	2912091
Ethiopia	614983	403697	431332	388681	349859
Ethiopia's Share (%)	15.8	12.3	19.6	17.8	**12.0**

Source: UNCTAD, 2019

Table 4.4: Ethiopia's share of World Sesame Seeds Export Volume

Exporters	Exported quantity, Tons, 2015	Exported quantity, tons, 2016	Exported quantity, Tons, 2017	Exported quantity, Tons, 2018	Exported quantity, Tons, 2019
World	1671095	No Quantity	No Quantity	No Quantity	2129555
Ethiopia	284488	288356	411542	333578	243676
Ethiopia's Share (%)	17.0	#VALUE!	#VALUE!	#VALUE!	**11.4**

Source: UNCTAD, 2019

Further detailed analysis of Ethiopia's sesame seed export volume and value data, for 2018, as presented in Table 4.5, showed that Ethiopia exports sesame seed mainly to China and Israel, with a market share of 61.9% and 20.4% respectively. In fact, China is the world leading importer of sesame seed. The second leading importer of sesame seeds from Ethiopia is Israel; but, it is the 6th major global importer of sesame seed. However, Ethiopia's export to Japan (3.5%) need also be an area of concern as Ethiopia should boost its exports to Japan (which is the world 2nd major importer). Further analysis shows that China is the world leading importer of sesame seed with a 36.2%market share in 2018. Though not a major importer as China, there are a number of countries accounting for more than 60% of global demand for sesame seeds. The 3rd and 4th importers, next to China and Israel, in 2018, with a lower market shares were Turkey (4.5%) and Japan (3.5%).

A further look at the data trends also showed that export volume and value growth rate for exports of sesame seed from Ethiopia over the 2014-2018 period has shown a decline for China by 13% and 0% respectively. This decline in import value growth is even higher, reaching

negative 8%, for the recent period of 2017-2018. However, between 2014-18, China's import value share from the world has decreased by 6%, which points to the need to continue to export to the Chinese market, as a major global buyer of sesame seed, and also increase market share in other existing markets, while also do international market research and develop new growing markets for sesame seed, among other measures.

Moreover, Ethiopia mainly exports to countries located far away, as can be seen from the distance between Ethiopia and the destination countries in km. China has a very high distance from Ethiopia, 9886km, while Israel has a distance of 2991 km. Japan has the highest distance of all importers, 11,995km, and a lowest market share of 3.5%.

However, though not leading importers, countries such as Netherlands, Germany, and also Egypt located relatively closer, not only are important importers globally, but also offer relatively higher export price (as measured by unit values). Given the experience of Ethiopia in exporting to these countries already, boosting export volume to these destinations could offer overall higher export proceeds but also help further diversify the destination countries to which Ethiopia exports sesame seed.

Table 4.5: Analysis of Ethiopia's sesame seeds export by destination: 2018*

	Value exported in 2018 (USD thousand)	Share in Ethiopia's exports (%)	Quantity exported in 2018	Quantity unit	Unit value (USD/ unit)	Ranking of partner countries in world imports	Share of partner countries in world imports (%)	Total imports growth in value of partner countries between 2014-2018 (%, p.a.)	Average distance between partner countries and all their supplying markets (km)
Total	349859	**100**	243676	Tons	1436		**100**	-6	
China	216438	**61.9**	160945	Tons	1345	1	**36.2**	-6	9886
Israel	71456	**20.4**	41497	Tons	1722	6	**3.1**	-10	2991
Turkey	15764	**4.5**	11333	Tons	1391	3	**6.7**	-1	4204
Japan	12363	**3.5**	8172	Tons	1513	2	**7.3**	-16	11995
Greece	7247	**2.1**	4863	Tons	1490	15	**1.7**	-11	4368
Jordan	6618	**1.9**	4419	Tons	1498	19	**1.4**	-12	3181
Saudi Arabia	3182	**0.9**	2375	Tons	1340	9	**2.4**	-8	2698

Mexico	2493	**0.7**	1520	Tons	1640	12	**1.9**	11	7833
United States of America	2480	**0.7**	1225	Tons	2024	8	**2.5**	-8	9744
Korea, Republic of	2214	**0.6**	1573	Tons	1408	4	**4.2**	-12	3657
Iran, Islamic Republic of	2117	**0.6**	1482	Tons	1428	5	**3.2**	10	2038
Netherlands	1982	**0.6**	1092	Tons	1815	16	**1.7**	-5	5873

* includes those importing countries with Ethiopia's sesame seeds export market share of above 0.5% in 2018.

Source: UNCTAD data

4.2.2 Comparative analysis of Ethiopia & African regional competitor countries' Exports

We now look at further disaggregated data for available time periods for Ethiopia and also the competing African region exporting countries. Accordingly, based on a five year average, 2014-18, the major destinations for Ethiopia's sesame seed exports were: China (56.5%), and Israel (17.8%), Turkey (4.8%), United Arab Emirates (2.5%), Vietnam (2.4%) and Jordan (2.4%).

For the three year period 2016-18, on average, Chad's export is highly concentrated to Turkey, with 94.4% share), followed at the far end with exports to Egypt (2.34%) and Nigeria (1.25%). During 2015-18, four year period, on average, Burkina Faso's export of sesame seed looks relatively well spread destination markets mainly in 4 markets, namely Singapore (32.6), China (22.9%), Togo (21.5%), and Japan (12.5%).

Nigeria's sesame seed export during the three year period, 2016-2018, on average, was relatively well spread across mainly three countries, namely, China (24.8%), Japan (21.7%), Turkey (18.7%). For the three year period 2016-18, on average, South Sudan's export of sesame seed was highly concentrated to just one country, Algeria, accounting for 89.2% of the sesame seed exports, followed at the far end by Joran (8.6%), and United Arab Emirates (2.2%).

For the five year period, 2014-18, on average, Sudan's export of sesame seed was mainly spread across just four destination countries, namely: China (29.6%), Egypt (19.8%), Saudi Arabia

(13.5%), India (10.1%). On average, during the five year period, 2014-18, Tanzania's export of sesame seed mainly concentrated to just one country, namely China (81.3%), followed by Japan (17.6%).

Finally, during the four year period 2015-2018, on average, a little over half of Uganda's export of sesame seed (52.3%) was destined to just one country, China, with Netherlands, Kenya and Japan accounting for 10.7%, 9.6%, and 9.1% share respectively.

4.2.3 Analysis of Global Major Importers of Sesame Seeds

China is the leading importer of sesame seed in the world market with a 36.2% share in 2018, followed at a far lower share by Japan (7.3%), Turkey (6.7%), Korea, Rep. (4.2%), Iran (3.2%), Israel (3.1%), Egypt (2.6%), USA (2.5%), Saudi Arabia (2.4%), India (2.2%), and Germany (2.1%). From the leading importers, Germany and India can be important markets to boost export trade, though India offers relatively lower export price, as measured by unit values, though it is clear that unit values do not account or differentiate for the specific quality levels of the export orders made. Expanding exports to Japan, the world second importer of sesame seed, after China, by meeting required quality and other import requirements needs to be considered.

An interesting observation from the trade data analysis was that Ethiopia exports its sesame seed not only to the leading global imports listed out above, but also to those importing countries commanding a significantly low market share as importers of sesame seed. In this regard, it is worth looking at the importing countries with less than 2.1% share as well. For example, Ethiopia exports sesame seed to Greece, Netherlands, Viet name and Jordan and the United Arab Emirates, each of which had, based on 2018 data, world sesame seed import market share of: 1.7%, 1.7%, 1.6%, 1.4, 1%, 0.7% respectively. Besides, newly emerging importers of sesame seed include Iran and Lebanon. Iran accounts for 3.2% share of world import value of sesame seed, which puts the country as the 5^{th} leading global importer of sesame seed in 2018, even preceding Israel, the second major export destination of sesame seed from Ethiopia. On the other hand, Lebanon had a 1.7% share of world import of sesame seed in 2018. See Table 4.5 & also Table 4.6.

Thus, based on the descriptive trade statistics analysis presented in this section, there are real opportunities for Ethiopia to produce and export sesame seed, and to address international market risks, and their consequent impact on the domestic macro and micro economy, by expanding the '**intensive** margin' – engaging in market development in existing markets & products, and by improving its '**extensive** margin' - penetrating in to new markets & products (value addition).

Table 4.6: World total import of sesame seeds by major importers: 2018*

	Value imported in 2018 (USD thousand	Trade balance in 2018 (USD thousand)	Quantity Unit	Unit value (USD/unit)	Share in world imports (%)	Average distance of supplying countries (km)
World	2945341	-33250	Tons	1398	**100**	7011
China	1067412	-988622	Tons	1289	**36.2**	9886
Japan	213701	-212252	Tons	1360	**7.3**	11995
Turkey	198094	-169996	Tons	1301	**6.7**	4204
Korea, Republic of	123320	-121350	Tons	1711	**4.2**	3657
Iran, Islamic Republic of	92856	-92851	Tons	1498	**3.2**	2038
Israel	92052	-91914	Tons	1722	**3.1**	2991
Egypt	77282	-60306	Tons	1722	**2.6**	4340
United States of America	74535	-45406	Tons	2065	**2.5**	9744
Saudi Arabia	70629	-70333	Tons	1386	**2.4**	2698
India	65667	465012	Tons	1325	**2.2**	3334
Germany	61652	-46276	Tons	1851	**2.1**	5042
Mexico	55212	-26478	Tons	1312	**1.9**	7833

* includes major importers with a global sesame seeds import market share of 1.9% or more, in 2018.

Source: UNCTAD data

4.3 Sesame Seed Export and import Concentration Ratios

4.3.1 Sesame Seed Export Concentration Ratios of Ethiopia, African & Global Competitors

The export concentration ratios for Ethiopia and other major exporter from the African Region and other major global competitors is presented in Table 4.7, for the recent year, 2019.

Accordingly, Ethiopia has highest export concentration ratio (0.33) among the top 4 leading exporter s of sesame seeds in the world. This concentration ratio is far higher than the global average of 0.11. In fact, Myanmar, Tanzania, China and Mozambique have highest export concentration ratios of 0.6, 0.76, 0.7 and 0.38 respectively. However, Sudan a major global producer and exporter, having very high RCA as Ethiopia, has a lower concentration ratio of just 0.19.

Table 4.7: Concentration Ratios for Major African Sesame seed exporting countries

Exporters	Concentration Ratio of importing countries (2019)
World	**0.11**
Sudan	**0.19**
India	**0.03**
Ethiopia	**0.33**
Nigeria	**0.14**
Myanmar	**0.6**
Tanzania, United Republic of	**0.76**
China	**0.7**
Mozambique	**0.38**

Burkina Faso	**0.21**
Somalia	**0.29**
Pakistan	**0.09**
Netherlands	**0.17**
Paraguay	**0.28**
Guatemala	**0.2**
Chad	**0.9**
Turkey	**0.11**
Uganda	**0.22**
Egypt	**0.2**

Source: UNCTAD data

4.3.2 Concentration ratio Analysis of for Major Importers of sesame seeds

Beside Ethiopia's, other African region and global competing sesame seeds exporters' concentration ratios, it is also useful to examine the concentration ratio from the perspective of the individual major sesame seeds importing countries in the world, as this would help to show whether the importing country's market is dominated by few exporting/supplying countries or not; and help in devising export market development and diversification strategies as well.

This analysis is done based on Ethiopia's sesame seeds major export destinations, which by and large, are also the world major importers of sesame seeds. Accordingly, while Ethiopia's export to China more than 50% of its sesames seeds exports, China's import concentration ratio in 2018 was 0.18. This shows that though Ethiopia exports its sesame seeds mainly to China, Ethiopia is not the only or dominant supplier to the Chinese market; rather there are a number of competing exporters. The world 2nd importer of sesame seeds, Japan, also has a lower concentration ratio of

0.15, though Israel had a higher concentration ratio of 0.63. This is further illustrated in Table 4.8 below for the major import trading partners for Ethiopia, with its implication on export competition and the need to maintain and upgrade export competitiveness in those important destination markets.

Table 4.8: Concentration ratio for Ethiopia's sesame seeds export major trading partners: 2018

Importers	Value exported in 2018 (USD thousand)	Share in Ethiopia's exports (%)	Concentration of all supplying countries of partner countries
Total	349859	**100**	
China	216438	**61.9**	0.18
Israel	71456	**20.4**	0.63
Turkey	15764	**4.5**	0.32
Japan	12363	**3.5**	0.15
Greece	7247	**2.1**	0.27
Jordan	6618	**1.9**	0.56
Saudi Arabia	3182	**0.9**	0.65
Mexico	2493	**0.7**	0.16
United States of America	2480	**0.7**	0.34
Korea, Republic of	2214	**0.6**	0.38
Iran, Islamic Republic of	2117	**0.6**	0.27
Netherlands	1982	**0.6**	0.21

Source: UNCTAD data

4.4 Revealed Comparative Advantage Indicator for Major African Region Sesame Seeds Exporting Countries

For the period under study, 1970-2018, except for most years in the case of Chad, and for some years in the case of Nigeria, all the major sesame seed producing and exporting countries of the

African Region has had a RCA (Revealed Comparative Advantage) >1, which shows the higher competitiveness of the sesame seed exports originating from the African Region. UNCTAD (2018) study on the Leather and Sesame seeds sector also found higher RCA results.

A further look at the RCA measure also clearly showed Sudan and Ethiopia as having a much higher comparative Advantage over all the other major African region countries sesame seed exporting countries. Besides, the RCA indicator was certainly greater than 1 and also much higher into three and four digits over most of the years in the study period.

On the high RCA indices, a study by Moyi and Kimuyu (1999) on RCA and propensity to export of Kenya found out RCA's are highly concentrated in a broad group of labour intensive products. The results are consistent with the factor proportions theory as hypothesized in the Heckscher-Ohlin framework. The RCA results are presented in Figure 4.3 and the data presented in Annex I.

RSCA

Similarly, the RSCA index results, esp. for recent years, showed that Ethiopia and Sudan have had highest RSCA for sesame seeds exports, of 0.99, followed by Tanzania, Burkina Faso, and Uganda, all with RSCA of above 0.90, in recent years.

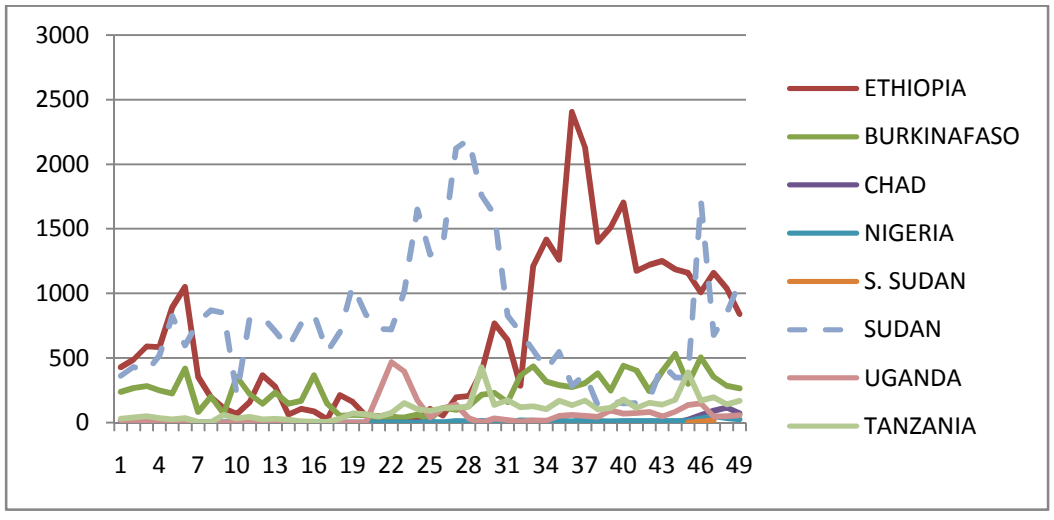

Figure 4.3: RCA index for Major African sesame seeds exporting countries
Source: Computed based on FAO data

4.5 Objective 3: Explain the factors affecting Ethiopia's sesame seeds export trade performance and competitiveness (using ARDL model, multivariate econometric method)

4.5.1 Trend Analysis: Regression of EXVAL and EXVOL on time (t)

a) Presentation of EXVAL and EXVOL in graphs

Figures 4.4 and 4.5, for linear and log data respectively, show the trend in the two dependent variables used in this study, namely, EXVAL and EXVOL, which generally showed a stagnant and low level trend followed by a fast rising trend in the post 1990s period to date.

(Value in 000USD; volume in tons)

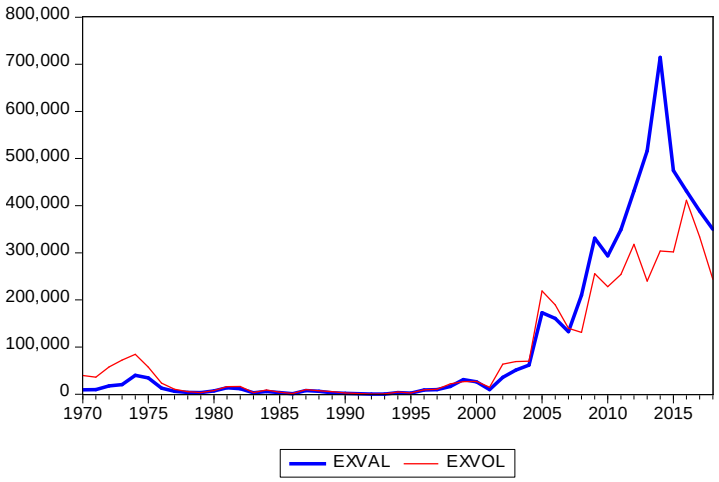

Figure 4.4: Ethiopia's Sesame Seed export volume and value (1970-2018): Linear Graph
Source: computed based on FAO data

Figure 4.5 also shows the same data in log form, both for EXVAL and EXVOL.

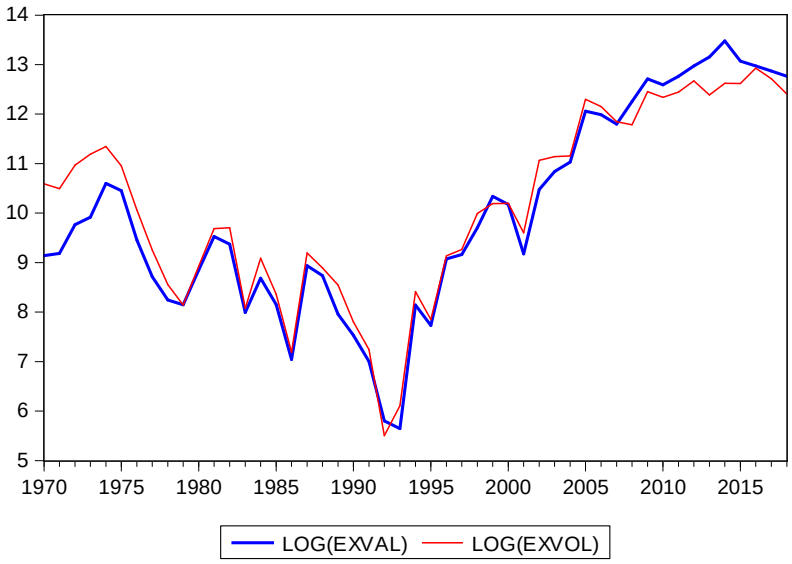

Figure 4.5: Ethiopia's Sesame seed Export Volume and Value (1970-2018): Log graph
Source: computed based on FAO data

Thus, except for major erratic movements observed in late 1970s and early 1990s, the graph of sesame seed export volume and value has been showing upward rising linear trend.

b) Trend Regression of EXVAL and EXVOL on time (t)

Table 4:9 Trend Regression with EXVAL as the dependent variable

Dependent Variable: LOG(EXVAL)
Method: Least Squares
Date: 04/30/21 Time: 15:20
Sample: 1970 2018
Included observations: 49

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-185.6891	30.90447	-6.008487	0.0000
YEAR	0.000269	4.25E-05	6.331006	0.0000

R-squared	0.460277	Mean dependent var	9.962354
Adjusted R-squared	0.448793	S.D. dependent var	2.067610
S.E. of regression	1.535062	Akaike info criterion	3.734979
Sum squared resid	110.7515	Schwarz criterion	3.812196
Log likelihood	-89.50698	Hannan-Quinn criter.	3.764275
F-statistic	40.08164	Durbin-Watson stat	0.245444
Prob(F-statistic)	0.000000		

Table 4:10 Trend Regression with EXVOL as the dependent variable

Dependent Variable: LOG(EXVOL)
Method: Least Squares
Date: 04/30/21 Time: 15:22
Sample: 1970 2018
Included observations: 49

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-134.2914	32.44257	-4.139359	0.0001
YEAR	0.000198	4.46E-05	4.452455	0.0001

R-squared	0.296664	Mean dependent var	10.15401
Adjusted R-squared	0.281699	S.D. dependent var	1.901370
S.E. of regression	1.611462	Akaike info criterion	3.832120
Sum squared resid	122.0500	Schwarz criterion	3.909337
Log likelihood	-91.88694	Hannan-Quinn criter.	3.861416
F-statistic	19.82436	Durbin-Watson stat	0.249659
Prob(F-statistic)	0.000052		

Thus, the result shows a statistically significant and positive linear relationship between each of the dependent variables (EXVAL and EXVOL) and time (t), as presented in Table 4.9 and 4.10.

Further presentation of the independent variables in linear/log form is made in Figures 4.6 and 4.7 respectively.

c) Linear presentation of the independent variables in Graph

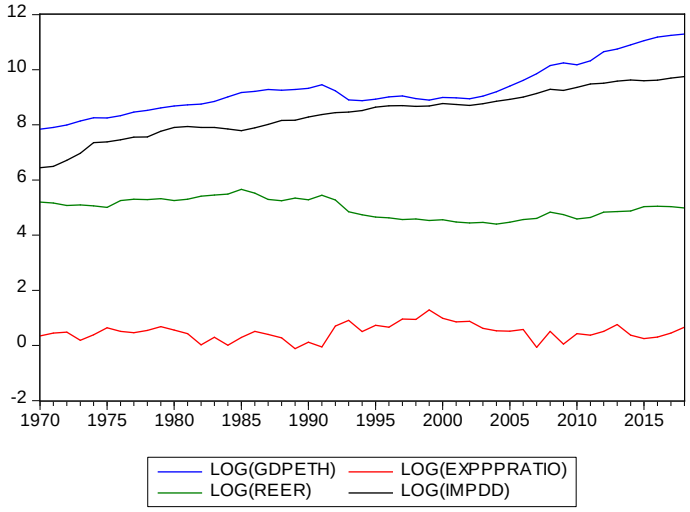

Figure 4.6: Linear graph of the independent variables
Source: computed based on FAO data

d) Log presentation of the independent variables in Graph

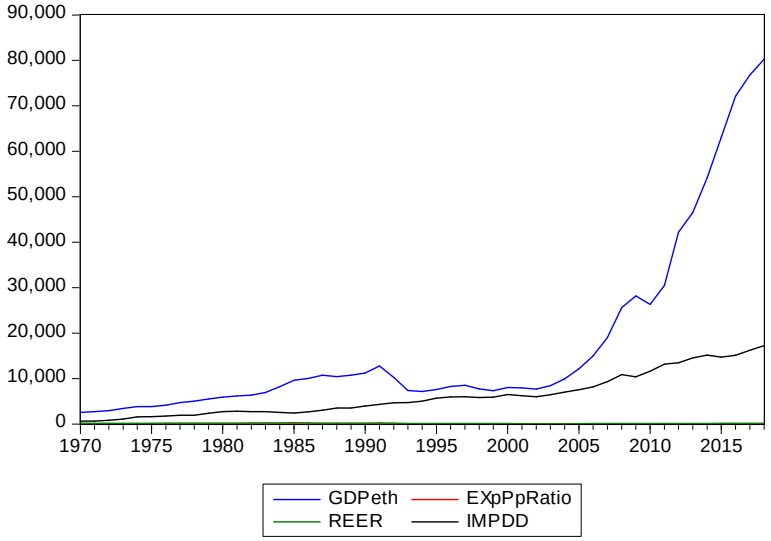

Figure 4.7: Log graph of the dependent variables

Source: computed based on FAO data

e) EXPPPRATIO Graph (in Linear& in Log)

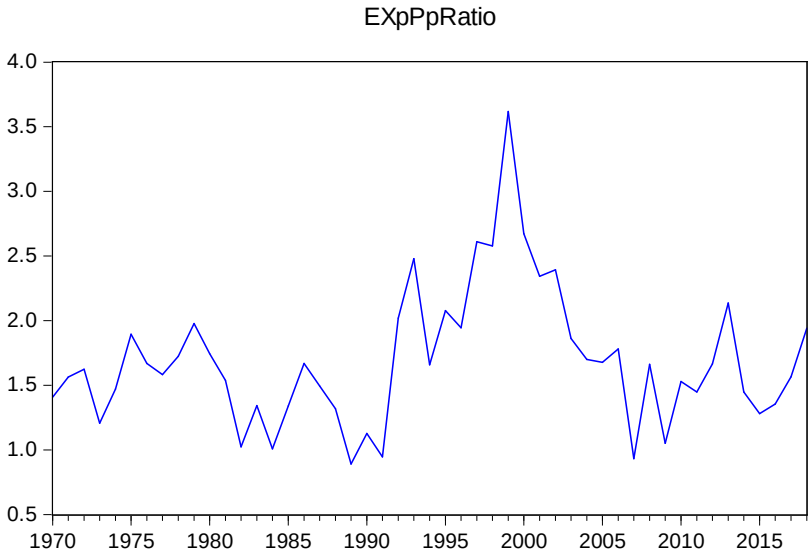

Figure 4.8: Linear graph of EXPPPRATIO (independent variable)

Source: computed based on FAO data

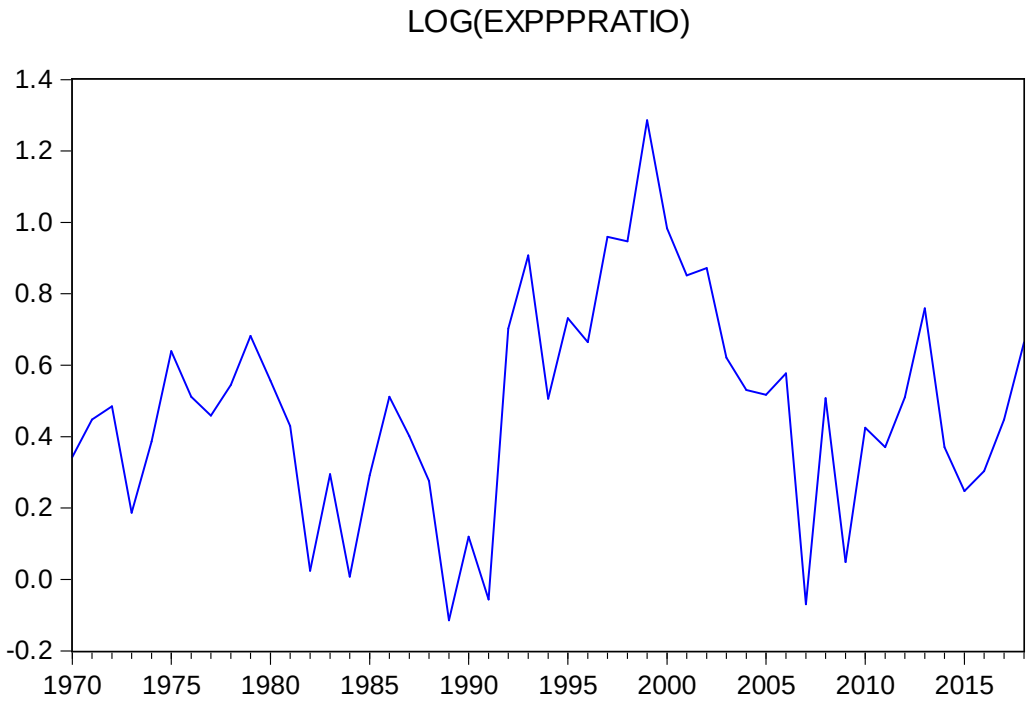

Figure 4.9: Log graph of EXPPPRATIO (independent variable)
Source: computed based on FAO data

The export price to producer price ratio is an important indicator of competitiveness. This is because as a worthwhile business export should generate decent income, improved standard of living and welfare both to the producers of the sesame seed (small holder and commercial farmers), while also creating similar gainful business to the different farm to export port chain of the sesame seeds export business, to maintain and upgrade its competitiveness in the fast changing and highly competitive and less differentiated primary commodities international markets.

Though there were times of very high ratios, the erratic nature of the ratios, as depicted in Figures 4:8 and 4:9, and importantly, their declining trends, gravitating towards 1, shows squeezing of income and profits for the different actors in the sesame seeds farm to export chain, and a real threat to the growth, competitiveness and development of the sesame seeds sub sector and its continued contribution to local and national economic development.

4.5.2 ARDL Model Results

4.5.2.1 STATIONARITY (ADF Unit Root Test, using SC/AIC for individual testing) for each of the variables

The stationarity tests and determining of the optimal lag order has been discussed in this section 4.5.2.1 and 4.5.2.2, for both equations (Y_1=EXVAL & Y_2=EXVOL).

- **Stationarity Test: Unit Root Test results**

The study applied the Augmented Dickey-Fuller (ADF) test for unit root test. Accordingly, the results of the unit root tests for the two equations namely, for each of the dependent variable of EXVAL and EXVOL, and the independent variables of GDPeth, EXPPPRATIO, REER and IMPDD. The unit root test has been conducted both for the Constant and Constant and Trend, and in each case at level as well as at first difference. The Null Hypothesis is the series has unit root while the Alternative Hypothesis is the series has no unit root, i.e., the series is stationary. Table 4.11 shows the summary of the ADF test results.

Accordingly, all variables, dependent and independent, are stationarity at I (1) while one independent variable, EXPPPRATIO, is stationary at both I (0) and I (1), i.e., at level and first difference respectively.

Table 4.11: ADF Test Results: Summary Table

Constant & Trend	**ADF Statistics**	**Y_1=EXVAL**	**Y_2=EXVOL**	**X_1=GDPeth**	**X_2=EXPPPRATIO**	**X_3=REER**	**X_4=IMPDD**
At Level							
With Constant	t-Statistic	-0.927444	-1.225191	-0.030111	-3.550034	-1.235561	-2.645588
	Prob.	0.7710	0.6561	0.9507	0.0107**	0.6515	0.0912
With Constant & Trend	t-Statistic	-1.866767	-2.018704	-1.323840	-3.548587	-1.154845	-4.971633
	Prob.	0.6561	0.5765	0.8696	0.0454	0.9083	0.0010
At 1st Difference							
With Constant	t-Statistic	-7.215687	-7.389556	-3.845968	-10.01494	-5.475345	-4.738388
	Prob.	0.0000*	0.0000*	0.0048*	0.0000*	0.0000*	0.0003*

With Constant & Trend	t-Statistic	-7.211999	-7.434398	-4.372774	-9.899388	-5.428622	-5.027500
	Prob.	0.0000	0.0000	0.0058	0.0000	0.0003	0.0009
ORDER of Integration		I (1)	I (1)	I (1)	I (1), I (0)	I (1)	I (1)

Note: (*) significance at 1%; (**) significance at 5%.

Source: EViews results, own summary

4.5.2.2 LAG ORDER

- **Determining the Optimal Lag Length for the two Models** (with EXVAL and EXVOL, as dependent variables)

Using EViews, the optimal lag length for the model is determined by using both the Akaike Information Criteria (AIC) and also Schwartz Criteria (SC), which actually yielded largely the same results. The selected optimal lag lengths are indicated with Asterisks (*). In line with this, applying maximum lag length of 4, the optimal lag length that best befits the model for this study is 1. (See the results in the Table 4.12 and 4.13).

Table 4.12: VAR Lag Order with EXVAL (dependent variable 1)

VAR Lag Order Selection Criteria
Endogenous variables: LOG(EXVAL) LOG(GDPETH) LOG(EXPPPRATIO) LOG(REER) LOG(IMPDD)
Exogenous variables: C
Date: 05/16/21 Time: 02:16
Sample: 1970 2018
Included observations: 45

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-105.8957	NA	9.51e-05	4.928697	5.129438	5.003531
1	**132.0904**	**412.5092***	**7.42e-09***	**-4.537349***	**-3.332908***	**-4.088345***
2	146.1306	21.21633	1.26e-08	-4.050248	-1.842105	-3.227074
3	171.0108	32.06785	1.42e-08	-4.044925	-0.833080	-2.847581
4	194.6773	25.24427	1.89e-08	-3.985658	0.229888	-2.414145

* 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 4:13 VAR Lag Order with EXVOL (dependent variable 2)

VAR Lag Order Selection Criteria
Endogenous variables: LOG(EXVOL) LOG(GDPETH) LOG(EXPPPRATIO) LOG(REER) LOG(IMPDD)
Exogenous variables: C
Date: 05/16/21 Time: 02:20
Sample: 1970 2018
Included observations: 45

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-103.0970	NA	8.40e-05	4.804312	5.005052	4.879146
1	**133.5186**	**410.1338***	**6.97e-09***	**-4.600827***	**-3.396386***	**-4.151824***
2	147.0200	20.40210	1.21e-08	-4.089778	-1.881635	-3.266604
3	172.6834	33.07731	1.32e-08	-4.119264	-0.907420	-2.921921
4	197.8647	26.86004	1.64e-08	-4.127321	0.088225	-2.555808

* 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 4.14 Descriptive Statistics results: 1970-2018

	EXVAL	GDPETH	EXPPPRATIO	REER	IMPDD
Mean	110932.0	17267.18	1.693663	153.6435	6218.069
Median	13728.00	8454.149	1.659175	153.4590	5005.553
Maximum	714546.0	80292.45	3.618497	286.5175	17224.26
Minimum	283.0000	2559.075	0.891533	81.49572	629.4032
Std. Dev.	176423.9	20255.75	0.526190	53.11140	4718.127

As Table 4.14 shows, there is wider increase over the years as observed from the minimum and maximum values over the years for the different variables under study. For instance, Export to producer price ratio has had minimum of below producer price (0.89) and a maximum of more than threefold the producer price of sesame seeds.

4.5.2.3 (Equation 1: Y_1 =EXVAL: ARDL Model Results & Post Estimation Tests

EQUATION 1

LOG(EXVAL) LOG(GDPETH) LOG(EXPPPRATIO) LOG(REER) LOG(IMPDD)
ARDL representation specifications of Equation (1) was run using EViews V. 9.5

Equation (1) where Y=EXVAL

Estimation Equation:
LOG(EXVAL) = C(1)*LOG(EXVAL(-1)) + C(2)*LOG(GDPETH) + C(3)*LOG(GDPETH(-1)) + C(4)*LOG(EXPPPRATIO) + C(5)*LOG(EXPPPRATIO(-1)) + C(6)*LOG(REER) + C(7)*LOG(IMPDD) + C(8)

Its Least Square specification:

log(exval) log(exval(-1)) log(gdpeth) log(gdpeth(-1)) log(exppratio) log(exppratio(-1)) log(reer) log(impdd) c

a) The ARDL Model Selection Result

The estimation results of the ARDL model selection for the Equation 1 (with dependent variable=EXVAL) has optimal lag of (1, 1, 1, 0, 0).

Accordingly, a one year lag of EXVAL and current GDP of Ethiopia has statistically significant and positive relationship with EXVAL, while lag of GDPeth, REER and IMPDD have negative but statistically significantly. On the other hand, EXPPRATIO has negative but statistically insignificant relationship with EXVAL, whereas one year lag of EXPPPRATIO has positive, but still marginally off the 5% level of significance (6.77%). (See Table 4.15)

ARDL MODEL SELECTION

Table 4.15: ARDL Model Selection

Dependent Variable: LOG(EXVAL)
Method: ARDL
Date: 04/30/21 Time: 14:40
Sample (adjusted): 1971 2018
Included observations: 48 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): LOG(GDPETH) LOG(EXPPPRATIO) LOG(REER) LOG(IMPDD)

Fixed regressors: C
Number of models evaluated: 16
Selected Model: ARDL(1, 1, 1, 0, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(EXVAL(-1))	0.643001	0.085048	7.560489	0.0000
LOG(GDPETH)	3.796142	1.174924	3.230968	0.0025
LOG(GDPETH(-1))	-2.288734	1.028026	-2.226339	0.0317
LOG(EXPPPRATIO)	-0.196035	0.422302	-0.464205	0.6450
LOG(EXPPPRATIO(-1))	0.783736	0.417386	1.877724	0.0677
LOG(REER)	-2.260245	0.596243	-3.790813	0.0005
LOG(IMPDD)	-1.427397	0.505768	-2.822237	0.0074
C	12.42374	3.770536	3.294954	0.0021

R-squared	0.927393	Mean dependent var	9.979495
Adjusted R-squared	0.914687	S.D. dependent var	2.085969
S.E. of regression	0.609277	Akaike info criterion	1.997923
Sum squared resid	14.84872	Schwarz criterion	2.309790
Log likelihood	-39.95015	Hannan-Quinn criter.	2.115778
F-statistic	72.98784	Durbin-Watson stat	2.148135
Prob(F-statistic)	0.000000		

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

b) F-Bound Test of Co-integration test

F-bound co-integration test of time series data showed that there is long run relationship among the dependent and independent variables. As shown in Table 4.16, the result shows that there is Co-integration among the variables under study, as the F-statistic value of 4.903224 is found to be higher than the upper bound value, at 2.5% level of significance.

Bound Co-integration test

Table 4.16: Bound Co integration test

ARDL Bounds Test
Date: 04/30/21 Time: 14:41
Sample: 1971 2018
Included observations: 48
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.903224	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

c) Error Correction Model (ECM) Estimation Results

Following the existence of long run relationship (Co-integration), the ARDL Co-integration and Long Run Form has been estimated. Accordingly, as presented in Table 4.17, the cointegrating equation shows statistically significant and positive coefficient/relationship of GDPeth with EXVAL, while REER and IMPDD have all statistically significant but negative coefficient/ relationship with EXVAL. However, EXPPRATIO has a negative but statistically insignificant relationship with EXVAL.

Besides, the ECM coefficient, also called the 'speed of adjustment' towards convergence to an equilibrium or steady state situation, as expected has a negative result and is also statistically significant, i.e., CointEq(-1)=-0.**356999**.

When we look at the long run coefficients of the ARDL model, similar to the co integrating form, we observe that while GDPeth has positive and statistically significant relation with EXVAL, while REER and IMPDD has negative and statistically significant relationship with EXVAL. On the other hand, unlike the co integrating form, for EXPPPRATIO in the long run has positive but still statistically insignificant relationship with EXVAL.

ECM

Table 4.17: ECM results

ARDL Cointegrating And Long Run Form
Dependent Variable: LOG(EXVAL)
Selected Model: ARDL(1, 1, 1, 0, 0)
Date: 04/30/21 Time: 14:43
Sample: 1970 2018
Included observations: 48

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(GDPETH)	3.796142	1.174924	3.230968	0.0025
DLOG(EXPPPRATIO)	-0.196035	0.422302	-0.464205	0.6450
DLOG(REER)	-2.260245	0.596243	-3.790813	0.0005
DLOG(IMPDD)	-1.427397	0.505768	-2.822237	0.0074
CointEq(-1)	-0.356999	0.085048	-4.197642	0.0001

Cointeq = LOG(EXVAL) - (4.2224*LOG(GDPETH) + 1.6462 *LOG(EXPPPRATIO) -6.3312*LOG(REER) -3.9983*LOG(IMPDD) + 34.8005)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDPETH)	4.222442	1.039762	4.060968	0.0002
LOG(EXPPPRATIO)	1.646225	1.451715	1.133986	0.2636
LOG(REER)	-6.331234	1.523273	-4.156335	0.0002
LOG(IMPDD)	-3.998322	1.265890	-3.158507	0.0030
C	34.800486	10.079416	3.452629	0.0013

On elasticity results, equation 1 (EXVAL) was highly elastic to three of the four independent variables, namely, GDPeth, REER and IMPDD, both in the short and long run. This showed the need to carryout relevant strategies and reforms towards economic growth, alignment of the appreciating real effective exchange rate, and the need to enhance comparative advantage & competitiveness to tap the global potential purchasing power in major sesame seed end-markets. However, EXVAL is less elastic to EXPPPRATIO in the short run, but highly elastic in the long run, though both the short run and long run results were statistically insignificant.

d) Pairwise Granger Causality Test Results

Pairwise Granger Causality test has been conducted on the four independent variables in relation to the dependent variables two equations, namely EXVAL and EXVOL. The result for Equation (1) with dependent variable, EXVAL, is presented in Table 4:18, where the Null Hypothesis is ‘there is no causality between two variables’.

While GDPeth does not granger cause EXVAL, EXVAL does granger cause GDPeth. While EXPPPRATIO granger cause EXVAL, EXVAL does not granger cause EXPPPRATIO. EXVAL and REER has bi directional causation. On the other hand, IMPDD and EXVAL have no causality relationship.

Table 4.18: Granger Causality test: 1970-2018

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG(GDPETH) does not Granger Cause LOG(EXVAL)	48	0.15845	0.6925
LOG(EXVAL) does not Granger Cause LOG(GDPETH)		19.6169	6.E-05
LOG(EXPPPRATIO) does not Granger Cause LOG(EXVAL)	48	7.40478	0.0092
LOG(EXVAL) does not Granger Cause LOG(EXPPPRATIO)		0.25166	0.6184
LOG(REER) does not Granger Cause LOG(EXVAL)	48	9.65585	0.0033
LOG(EXVAL) does not Granger Cause LOG(REER)		7.84947	0.0075
LOG(IMPDD) does not Granger Cause LOG(EXVAL)	48	1.63870	0.2071
LOG(EXVAL) does not Granger Cause LOG(IMPDD)		2.91818	0.0945

e) Post Estimation Diagnostic Test Results

Diagnostic tests that included serial correlation and heteroscedasticity tests were conducted to ensure the acceptability of the model. Normality, Ramsey RESET and Wald Tests were also included. In addition, cumulative sum (CUSUM), and cumulative sum of squares (CUSUMQ) estimates were also applied to the series to assess stability of the coefficients. Summary of the diagnostic test results is presented in Table 4.19.

Table 4.19: Summary of the diagnostic test results

Dependent Variable: **EXVAL (Equation 1)**

Diagnostic Test Statistics	**Statistic**	**Value**	**df**	**Probability**
Ramsey RESET test: (Omitted variables test)	t-statistic	0.576345	39	0.5677
1 fitted term	F-statistic	0.332174	(1, 39)	0.5677
2 fitted terms	F-statistic	0.514455	(2, 38)	0.6019

Wald test (for testing linear restrictions)				
Null Hypothesis: C(1)=C(2)=C(3)=C(4)=C(5)=C(6)=C(7)=0	F-statistic	1673.544	(8, 40)	0.0000
	Chi-square	13388.35	8	0.0000
Autocorrelation test: Breusch-Godfrey Serial Correlation LM Test				
	F-statistic	0.372588		Prob. F(1,39)=0.5451
	Obs*R-squared	0.454231		Prob. Chi-Square(1)=0.5003
Heteroscedasticity test: Breusch-Pagan-Godfrey				
	F-statistic	1.328806		Prob. F(7,40)=0.2623
	Obs*R-squared	9.056062		Prob. Chi-Square(7)=0.2487
Heteroscedasticity test:ARCH				
	F-statistic	2.356365		Prob. F(1,45)=0.1318
	Obs*R-squared	2.338632		Prob. Chi-Square(1)=0.1262

Ramsey RESET TEST

The Null Hypothesis for Ramsey RESET test is there is correct specification of the model. Thus, based the Ramsey test result of 0.5677 (for Omitted Variables: Squares of fitted values), and 0.6019 (for Omitted Variables: Powers of fitted values from 2 to 3), thus we fail to reject the Null Hypothesis of 'no model misspecification'.

WALD TEST (for testing linear restrictions)

We can use Wald Test to testing linear restrictions of the coefficients of the model, i.e., to test joint null hypothesis on the coefficient restrictions, such as C(1)=C(2)= … C(n)=0. The results obtained shows that the coefficients in the model are not equal to zero jointly, showing importance of the variables in the model. The lower P-value of the Wald test statistic, i.e., 0.0000, and the results being <5% significance level show that we reject the null hypothesis of the validity of the restrictions.

Autocorrelation Test

As the model used for this study is ARDL model, with lag of the dependent variable used as explanatory variable, the Autocorrelation test used is the Breusch-Godfrey Serial Correlation LM

Test. Accordingly, based on a Null Hypothesis being 'no serial correlation', with a P-value of 0.5451, which is greater than 5% level of significance; we fail to reject the Null Hypothesis. Thus, there is no serial correlation.

Heteroscedasticity Test

Breusch-Pagan-Godfrey heteroscedasticity test result of 0.2623, confirms absence of heteroscedasticity, i.e., existence of homoscedasticity of variance. ARCH result also shows a result of 0.1318.

Stability Test

In order to check the stability of the model, stability test was conducted based on recursive estimates of Cumulative SUM (CUSUM) and Cumulative SUM SQUARE (CUSUMSQ) tests, which showed that the model is stable as it is within the 5% significance boundaries. (See Figures 4.10 and 4.11).

CUSUMSQ

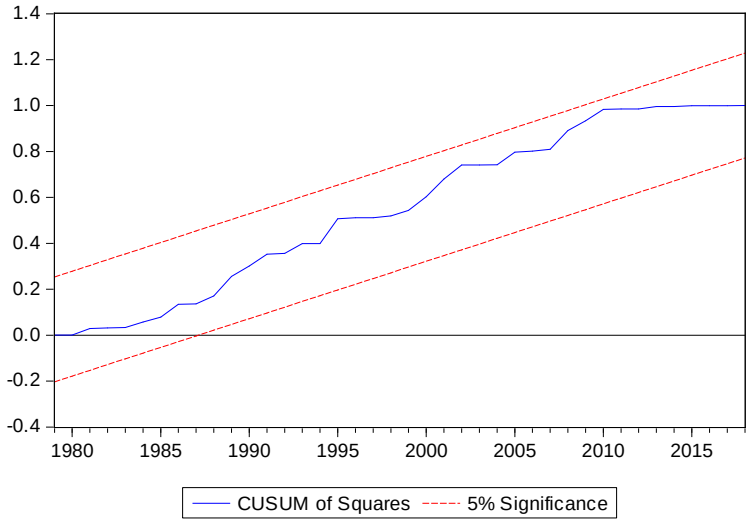

Figure 4.10: CUMSUMSQ Graph

CUSUM

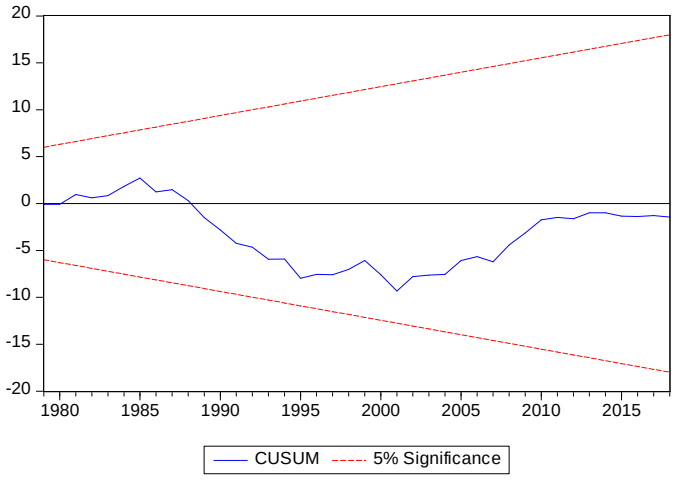

Figure 4.11: CUMSUM Graph

Normality Test of the Residual/Error term

As presented in Figure 4.12, based on the Jarque-Bera test, the residual/error term is normally distributed with the Jarque-Bera test result of 0.472185; and a higher probability value of 0.789708, i.e., with a significance level greater than 5%, confirming normality of the residual/ error term distribution. Besides, the skewedness (unidirectional distribution) result is 0.041297 (which is closer to zero), while the kurtosis (peakedness of distribution) result is 2.521178 (which is closer to 3).

Residual diagnostic Histogram: Normality test

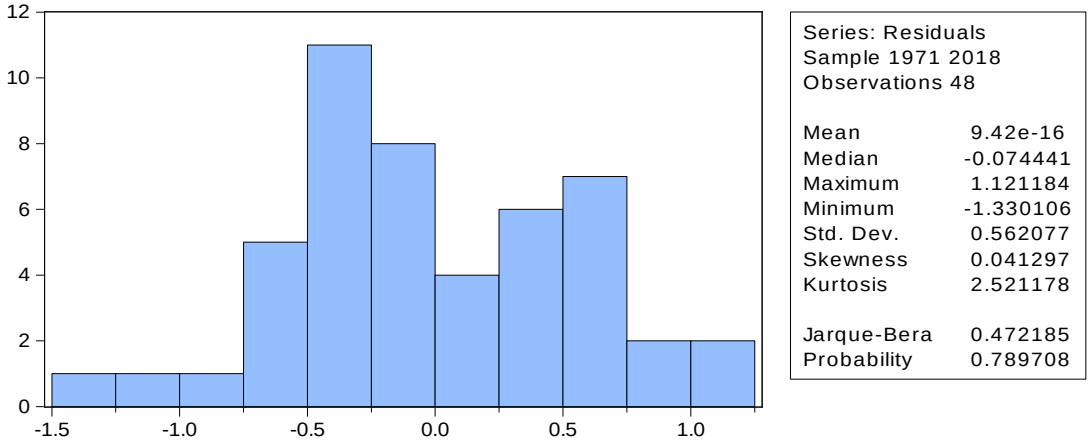

Figure 4.12: Normality test: Histogram

4.5.2.4 (Equation 2, Y=EXVOL): ARDL Model Results & Post Estimation Tests

EQUATION 2

LOG(EXVOL) LOG(GDPETH) LOG(EXPPPRATIO) LOG(REER) LOG(IMPDD)

ARDL representation specifications of Equation (2) was run using EViews V. 9.5

Equation (2) where Y=EXVOL

Estimation Equation:

LOG(EXVOL) = C(1)*LOG(EXVOL(-1)) + C(2)*LOG(GDPETH) + C(3)*LOG(GDPETH(-1)) + C(4)*LOG(EXPPPRATIO) + C(5)*LOG(EXPPPRATIO(-1)) + C(6)*LOG(REER) + C(7)*LOG(IMPDD) + C(8)

Its Least Square specification:

log(exvol) log(exvol(-1)) log(gdpeth) log(gdpeth(-1)) log(exppratio) log(exppratio(-1)) log(reer) log(impdd) c

The stationarity tests are already discussed in Table 4.11, while determining of the optimal lag order was also discussed in the preceding section 4.5.2.1 and 4.5.2.2, both for equations, Y_1=EXVAL & Y_2=EXVOL.

Table 4.20 Descriptive Statistics results: 1970-2018

	EXVOL	GDPETH	EXPPPRATIO	REER	IMPDD
Mean	89066.49	17267.18	1.693663	153.6435	6218.069
Median	26642.00	8454.149	1.659175	153.4590	5005.553
Maximum	411542.0	80292.45	3.618497	286.5175	17224.26
Minimum	246.0000	2559.075	0.891533	81.49572	629.4032
Std. Dev.	115064.9	20255.75	0.526190	53.11140	4718.127

As Table 4.20 shows, there is wider increase over the years as observed from the minimum and maximum values over the years for the different variables under study, including EXVOL. For instance, Export to producer price ratio has had minimum of below producer price (0.89) and a maximum of more than threefold the producer price of sesame seeds.

a) ARDL Model selection result

The estimation results of the ARDL model selection for the Equation 2 (with dependent variable=EXVOL) is found to be largely similar to Equation 1 (EXVAL), with optimal lag of (1, 1, 1, 0, 0).

Accordingly, a one year lag of EXVOL and current GDP of Ethiopia has statistically significant and positive relationship with EXVOL, while lag of GDPeth and EXPPPRATIO has negative but statistically insignificant relationship with EXVOL. REER and IMPDD have negative but statistically significant relationship with EXVOL. On the other hand, lag of EXPPRATIO has positive and statistically significant relationship with EXVOL. (See Table 4.21)

ARDL MODEL SELECTION

Table 4.21: ARDL Model Selection

Dependent Variable: LOG(EXVOL)
Method: ARDL
Date: 04/30/21 Time: 15:39
Sample (adjusted): 1971 2018
Included observations: 48 after adjustments
Maximum dependent lags: 1 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (1 lag, automatic): LOG(GDPETH) LOG(EXPPPRATIO) LOG(REER) LOG(IMPDD)
Fixed regressors: C
Number of models evalulated: 16
Selected Model: ARDL(1, 1, 1, 0, 0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LOG(EXVOL(-1))	0.613307	0.083702	7.327301	0.0000
LOG(GDPETH)	3.444703	1.170477	2.942992	0.0054
LOG(GDPETH(-1))	-1.674777	1.011372	-1.655946	0.1056
LOG(EXPPPRATIO)	-0.672976	0.409745	-1.642426	0.1083
LOG(EXPPPRATIO(-1))	1.184107	0.407221	2.907770	0.0059
LOG(REER)	-2.685207	0.621624	-4.319663	0.0001
LOG(IMPDD)	-1.871813	0.526937	-3.552255	0.0010
C	16.26678	4.113072	3.954899	0.0003

R-squared	0.919703	Mean dependent var	10.14493
Adjusted R-squared	0.905651	S.D. dependent var	1.920416
S.E. of regression	0.589879	Akaike info criterion	1.933215
Sum squared resid	13.91831	Schwarz criterion	2.245082
Log likelihood	-38.39715	Hannan-Quinn criter.	2.051070
F-statistic	65.45031	Durbin-Watson stat	2.106472

Prob(F-statistic)	0.000000

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

b) F-Bound Test of Co-integration test

F-bound co-integration test of time series data showed that there is long run relationship among the dependent and independent variables. As shown in Table 4.22, the result shows that there is Co-integration among the variables under study, as the F-statistic value of 4.983433 is found to be higher than the upper bound value, at 2.5% level of significance.

Bound Co-integration test

Table 4.22: Bound Co integration test

ARDL Bounds Test
Date: 04/30/21 Time: 15:40
Sample: 1971 2018
Included observations: 48
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	4.983433	4

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.45	3.52
5%	2.86	4.01
2.5%	3.25	4.49
1%	3.74	5.06

c) Error Correction Model (ECM) Estimation Results

Following the existence of long run relationship (Co-integration), the ARDL Co-integration and Long Run Form has been estimated. Accordingly, as presented in Table 4.3, the cointegrating

equation shows statistically significant and positive coefficient/relationship of GDPeth with EXVOL, while REER and IMPDD have all statistically significant but negative coefficient/ relationship with EXVOL. However, EXPPRATIO has a negative but statistically insignificant relationship with EXVOL.

Besides, the ECM coefficient, also called the 'speed of adjustment' towards convergence to an equilibrium or steady state situation, as expected has a negative result and is also statistically significant, i.e., CointEq(-1)=- -0.**386693**.

When we look at the long run coefficients of the ARDL model, similar to the co integrating form, we observe that while GDPeth has positive and statistically significant relation with EXVOL, while REER and IMPDD has negative and statistically significant relationship with EXVOL. On the other hand, unlike the co integrating form, for EXPPPRATIO in the long run has positive but still statistically insignificant relationship with EXVOL.

ECM

Table 4.23: ECM results

ARDL Cointegrating And Long Run Form
Dependent Variable: LOG(EXVOL)
Selected Model: ARDL(1, 1, 1, 0, 0)
Date: 04/30/21 Time: 15:45
Sample: 1970 2018
Included observations: 48

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOG(GDPETH)	3.444703	1.170477	2.942992	0.0054
DLOG(EXPPPRATIO)	-0.672976	0.409745	-1.642426	0.1083
DLOG(REER)	-2.685207	0.621624	-4.319663	0.0001
DLOG(IMPDD)	-1.871813	0.526937	-3.552255	0.0010
CointEq(-1)	-0.386693	0.083702	-4.619895	0.0000

Cointeq = LOG(EXVOL) - (4.5771*LOG(GDPETH) + 1.3218 *LOG(EXPPPRATIO) -6.9440*LOG(REER) -4.8406*LOG(IMPDD) + 42.0664)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(GDPETH)	4.577085	0.939199	4.873394	0.0000
LOG(EXPPPRATIO)	1.321800	1.302266	1.015000	0.3162
LOG(REER)	-6.944030	1.346185	-5.158302	0.0000
LOG(IMPDD)	-4.840569	1.135090	-4.264479	0.0001
C	42.066418	8.832438	4.762719	0.0000

On elasticity results, equation 2 (EXVOL) was highly elastic to three of the four independent variables, namely, GDPeth, REER and IMPDD, both in the short and long run. This showed the need to carryout relevant strategies and reforms towards economic growth, alignment of the appreciating real effective exchange rate, and the need to enhance comparative advantage & competitiveness to tap the global potential purchasing power in major sesame seed end-markets. However, EXVOL are less elastic to EXPPPRATIO in the short run, but highly elastic in the long run, though both the short run and long run results were statistically insignificant.

d) Pairwise Granger Causality Test Results

Pairwise Granger Causality test has been conducted on the four independent variables in relation to the dependent variables two equations, namely EXVAL and EXVOL. The result for Equation (2) with dependent variable, EXVOL, is presented in Table 4.24, where the Null Hypothesis is 'there is no causality between two variables'.

While GDPeth does not granger cause EXVOL, EXVOL does granger cause GDPeth. While EXPPPRATIO granger cause EXVOL, EXVOL does not granger cause EXPPPRATIO. EXVOL and REER have bi directional causation. On the other hand, IMPDD and EXVOL have no causality relationship.

Table 4.24: Granger Causality test results: 1970-2018

Lags: 1

Null Hypothesis:	Obs	F-Statistic	Prob.
LOG(GDPETH) does not Granger Cause LOG(EXVOL)	48	0.41027	0.5251
LOG(EXVOL) does not Granger Cause LOG(GDPETH)		19.3537	7.E-05
LOG(EXPPPRATIO) does not Granger Cause LOG(EXVOL)	48	11.5586	0.0014

LOG(EXVOL) does not Granger Cause LOG(EXPPPRATIO)		0.20831	0.6503
LOG(REER) does not Granger Cause LOG(EXVOL)	48	9.64626	0.0033
LOG(EXVOL) does not Granger Cause LOG(REER)		9.25193	0.0039
LOG(IMPDD) does not Granger Cause LOG(EXVOL)	48	2.03410	0.1607
LOG(EXVOL) does not Granger Cause LOG(IMPDD)		3.93248	0.0535

e) Post Estimation Diagnostic Test Results

Summary of the diagnostic test results is presented in Table 4.25.

Table 4.25: Summary of the diagnostic test results

Dependent Variable: **EXVOL (Equation 2)**

Diagnostic Test Statistics	**Statistic**	**Value**	**df**	**Probability**
Ramsey RESET test: (Omitted variables test)	t-statistic	1.528859	39	0.1344
1 fitted term	F-statistic	2.337411	(1, 39)	0.1344
2 fitted terms	F-statistic	1.229118	(2, 38)	0.3039
Wald test (for testing linear restrictions)				
Null Hypothesis: C(1)=C(2)=C(3)=C(4)=C(5)=C(6)= C(7)=0	F-statistic	65.45031	(7, 40)	0.0000
	Chi-square	458.1522	7	0.0000
Autocorrelation test: Breusch-Godfrey Serial Correlation LM Test				
	F-statistic	0.219501		Prob. F(1,39)=0.6420
	Obs*R-squared	0.268643		Prob. Chi-Square(1)=0.6042
Heteroscedasticity test: Breusch-Pagan-Godfrey				
	F-statistic	1.075096		Prob. F(7,40)=0.3971
	Obs*R-squared	7.600781		Prob. Chi-Square(7)=0.3691
Heteroscedasticity test: ARCH				
	F-statistic	1.568043		Prob. F(1,45)=0.2170
	Obs*R-squared	1.582588		Prob. Chi-Square(1)=0.2084

Ramsey RESET Test (for Model Misspecification)

The Null Hypothesis for Ramsey RESET test is there is correct specification of the model. Thus, based the Ramsey test result of 0.1344 (for Omitted Variables: Squares of fitted values), and 0.3039 (for Omitted Variables: Powers of fitted values from 2 to 3), thus we fail to reject the Null Hypothesis of 'no model misspecification'.

WALD TEST (for testing linear restrictions)

We can use Wald Test to testing linear restrictions of the coefficients of the model, i.e., to test joint null hypothesis on the coefficient restrictions, such as C(1)=C(2)= … C(n)=0. The results obtained shows that the coefficients in the model are not equal to zero jointly, showing importance of the variables in the model. The lower P-value of the Wald test statistic, i.e., 0.0000, and the results being <5% significance level show that we reject the null hypothesis of the validity of the restrictions.

Autocorrelation Test

As the model used for this study is ARDL model, with lag of the dependent variable used as explanatory variable, the Autocorrelation test used is the Breusch-Godfrey Serial Correlation LM Test. Accordingly, based on a Null Hypothesis being 'no serial correlation', with a P-value of 0.6420, which is greater than 5% level of significance; we fail to reject the Null Hypothesis. Thus, there is no serial correlation.

Heteroscedasticity Test

Breusch-Pagan-Godfrey heteroscedasticity test result of 0.3971, confirms absence of heteroscedasticity, i.e., existence of homoscedasticity of variance. ARCH result also shows a result of 0.2170.

Stability Test

In order to check the stability of the model, stability test was conducted based on **recursive** estimates of Cumulative SUM (CUSUM) and Cumulative SUM SQUARE (CUSUMSQ) tests.

As depicted in Figure 4.13 and 4.14 respectively, both CUMSUM & CUMSUMSQ tests showed that the model is stable as it is within the 5% significance boundaries.

CUSUM

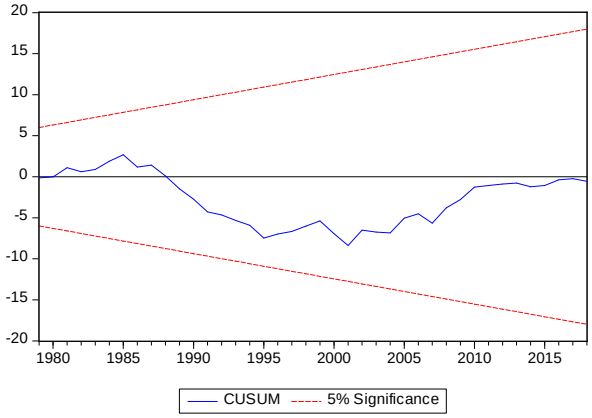

Figure 4.13: CUMSUM graph

CUSUMSQ

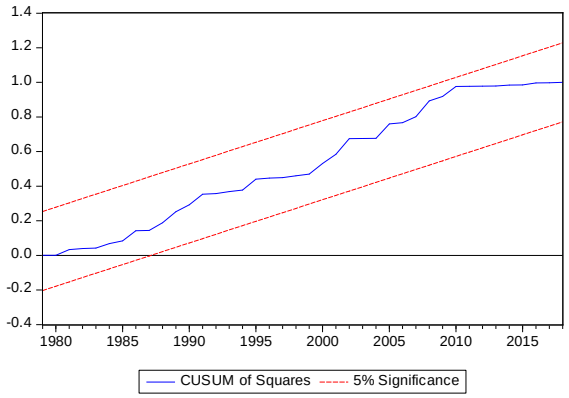

Figure 4.14: CUMSUMSQ graph

Normality Test of the Residual/Error term

As presented in Figure 4.15, based on the Jarque-Bera test, the residual/error term is normally distributed with the Jarque-Bera test result of 0.996001; and a higher probability value of 0.607745, i.e., with a significance level greater than 5%, confirming normality of the residual/error term distribution. Besides, the skewedness (unidirectional distribution) result is

0.105876 (which is closer to zero), while the kurtosis (peaked ness of distribution) result is 2.326827 (which is closer to 3).

Residual diagnostic Histogram: Normality test

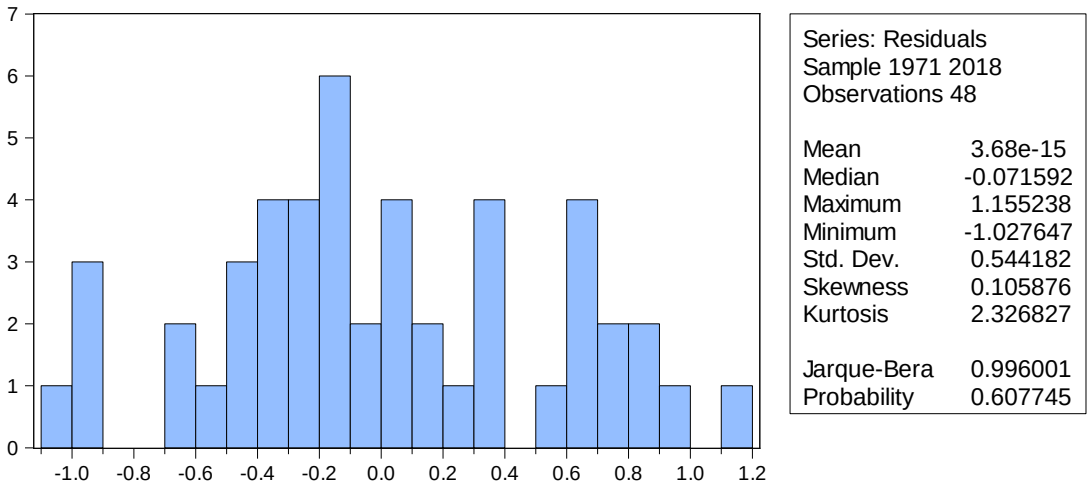

Figure 4.15: Normality Test: Histogram

4.6 Objective 4: Assess Ethiopia's, & other major African regional & global competitors, sesame seeds export potentials in major import trading partners/destination markets globally.

4.6.1 Ethiopia's Export Potential estimate results

The resulting export potential estimates showed that the markets with greatest potential for Ethiopia's exports of Sesame seeds are: China, Israel and Saudi Arabia. For instance, China showed the largest absolute difference between potential and actual exports in value terms, leaving room to realize additional exports worth $329.3 million.

4.6.2 Breakdown of Ethiopia's Aggregate Export Potential on Sesame seeds exports

Table 4.26 providers further breakdown of the aggregate export potential by major sesame seeds importing countries, which are also import trading partners for Ethiopia's sesame seed exports.

Table 4.26: Sesame seeds export potential estimates in major Import trade partners for Ethiopia

Ethiopia's Actual exports, total & untapped export potentials in major importing countries					
China	**Export potential$549.0 mn** Actual exports$219.7 mn **Untapped potential** remaining**$329.3 mn**	Japan	**Export potential$62.6 mn** Actual exports$13.6 mn **Untapped potential** remaining**$49.0 mn**	Netherlands	**Export potential$20.3 mn** Actual exports$1.6 mn **Untapped potential** remaining**$18.7 mn**
Israel	**Export potential$104.7 mn** Actual exports$72.2 mn **Untapped potential** remaining**$32.5 mn**	India	**Export potential$36.4 mn** Actual exports$742.4 k **Untapped potential** remaining**$35.6 mn**	Germany	**Export potential$13.9 mn** Actual exports$972.3 k **Untapped potential** remaining**$12.9 mn**
Saudi Arabia	**Export potential$69.3 mn** Actual exports$6.3 mn **Untapped potential** remaining**$62.9 mn**	Korea, Republic of	**Export potential$30.1 mn** Actual exports$3.7 mn **Untapped potential** remaining**$26.4 mn**	Greece	**Export potential$10.2 mn** Actual exports$5.3 mn **Untapped potential** remaining**$4.8 mn**
Jordan	**Export potential$27.9 mn** Actual exports$8.8 mn **Untapped potential** remaining**$19.0 mn**	United States	**Export potential$22.0 mn** Actual exports$2.1 mn **Untapped potential** remaining**$19.9 mn**	Indonesia	**Export potential$7.2 mn** Actual exports$9.7 k **Untapped potential** remaining**$7.2 mn**
Turkey	**Export potential$47.6 mn** Actual exports$16.2 mn **Untapped potential** remaining**$31.4 mn**	Viet Nam	**Export potential$20.4 mn** Actual exports$2.1 mn **Untapped potential** remaining**$18.3 mn**	Russian Federation	**Export potential$5.9 mn** Actual exports$0 **Untapped potential** remaining**$5.9 mn**

Source: extracted from UNCTAD data

4.6.3 African Regional and other global Export potential for sesame seeds export

Table 4.27 shows a summary of Ethiopia, African region and other global sesame seed exporting countries export potential estimates.

Table 4.27: Sesame seeds export potential for Major African & Other Global Competitor countries

Major African and Other Global Exporting Countries			
Africa	**Estimates**	**Other global**	**Estimates**
Ethiopia	Export potential$1.1 bn Actual exports$371.7 mn Untapped potential remaining in individual countries$763.2 mn	India	Export potential$761.9 mn Actual exports$467.5 mn Untapped potential remaining in individual countries$372.0 mn
Sudan	Export potential$790.4 mn Actual exports$599.9 mn Untapped potential remaining in individual countries$254.1 mn	Myanmar	**Export potential$102.3 mn** Actual exports$46.5 mn **Untapped potential** remaining in individual countries**$74.2 mn**
Nigeria	Export potential$555.1 mn Actual exports$293.9 mn Untapped potential remaining in individual countries$291.9 mn	China	**Export potential$96.5 mn** Actual exports$77.5 mn **Untapped potential** remaining in individual countries**$71.7 mn**
Tanzania, United Republic of	Export potential$278.5 mn Actual exports$134.8 mn Untapped potential remaining in individual countries$143.8 mn	Pakistan	**Export potential$85.7 mn** Actual exports$45.2 mn **Untapped potential** remaining in individual countries**$52.8 mn**
Niger	Export potential$290.0 mn Actual exports$165.8 mn Untapped potential remaining in individual countries$124.3 mn	United States	**Export potential$95.8 mn** Actual exports$16.0 mn **Untapped potential** remaining in individual countries**$89.9 mn**

Source: extracted from UNCTAD data

CHAPTER FIVE: DISCUSSIONS

5.1 Discussion on the ARDL Model results of the study (both Equations: 1 & 2)

EXVAL or EXVOL to GDPeth:

On GDP of Ethiopia, this positive and significant relation to sesame seeds export shows improved economic growth contribute to further expansion and competitiveness of sesame seeds export. Granger causality from EXVAL or EXVOL to GDPeth shows also the importance of sesame seed export performance and competitiveness to economic growth in the country.

EXVAL or EXVOL to EXPPPRATIO:

The negative and statistically insignificant relationship of EXPPPRATIO with EXVAL and EXVOL could reflect the very feature of primary commodities in international trade, of which sesame seeds is one. Specifically, this includes the low or deteriorating terms of trade, and price taker situation of developing country exporters of primary commodities. Besides, the specific domestic market situation of sesame seeds where export costs are often rising higher than international prices, as many exporters engage in the trade also to obtain the meager foreign exchange to engage in import and trading of other merchandizes.

EXVAL or EXVOL to REER:

The statistically significant but negative relationship of REER to EXVAL and EXVOL is likely a reflection of the nature of the commodity export under study, which is natural sesame seeds, a primary agricultural commodity.

First, theoretically, decreasing nominal as well real effective exchange rate could help boost export competitiveness through increased demand for the commodity in international markets. However, agricultural commodities, such as natural sesame seeds from Ethiopia, are normally produced under a traditional agricultural farming system. This means supply is available only following the Main/Meher growing season in Ethiopia, and largely exported within few months following harvesting. So, Ethiopia cannot benefit fully from the effect of devaluations of national

currency, as would have been the case had the exports been a manufacturing product, where supply could respond faster to meet possible demand/order abroad within shorter durations.

Second, Ethiopia's national currency has been undergoing a series of devaluations (by the National Bank of Ethiopia) and also depreciations (through interbank trading). However, for instance, according the NBE report (2019), for the report period of 2012/13 – 2018/19, the REER, as well as NEER, has rather been appreciating in relation to the major trading partners of the country, following the appreciation of the USD against almost all currencies. Consequently, this may by and large explain the diminished role of the series of devaluations or depreciations, towards positively supporting export trade expansion and competitiveness.

This clearly points to the need for creating a conducive real exchange rate alignment and appropriate exchange rate management system, in order to realize the full benefits from the REER for export trade development and competitiveness.

EXVAL or EXVOL to IMPDD:

Rising income (as measured by GDPpc) of import trading partners is an opportunity for increasing their demand and import of sesame seeds. Of course, while having statistically significant result, IMPDD was found to have negative relationship to EXVAL and EXVOL.

This may be explained by the larger share of sesame seeds in Ethiopia's exports, but the very low importance of such commodity, in the import basket of the import trading partners. This could be because, first, Ethiopia is not the only exporter of sesame seeds, there are many suppliers in the international market; second, as the importing countries are largely developed or fast growing economies, as also discussed in the relevant studies below, such countries use increasing share of their rising income to import of advanced or sophisticated and high technological and scientific products, and not devote their income increasingly to primary commodities.

5.2 Review of relevant studies that included similar variables to this study

Review of related empirical studies that covered a number of explanatory variables, including those included in this study, found mixed results (i.e., largely similar results, as well as some with differing results) in relation to this study.

For instance, Lien et al. (2019), in a study using commodity specific gravity approach on China, found out that excepting distance, the remaining variables, including Gross Domestic Product, population, income, exchange rate, production and price had statistical significance and correlated with the total export as hypothesized; with price and production (as the best predictors). Moreover, the determinants of China's rice export highly depended on the components of exporter side than that of importer sides.

In a study on Albanian agricultural exports, Braha et al. (2017), using augmented gravity model, found out that agricultural export flow increases with increasing economic size of importers, exchange rate variability; low transportation costs (distance), adjacency proximity (sharing common border) and linguistic similarities, and presence of Albanian Diaspora residing in the importing countries; whereas it decreases with growth in domestic demand due to increase in population; while bilateral institutional distance has diminishing effects on Albanian agricultural exports.

A panel – gravity model export competitiveness and export potential analysis for Pakistan rice export with its 109 trading partners showed positive relationship between rice export of Pakistan and the main components of the gravity model, GDP of Pakistan and trading partner, the difference in income, common border, and WTO membership and an inverse relationship with distance, exchange rates and trade agreement (Irshad et al., 2018).

Using augmented gravity model, Wang and Badman (2016) found that consistent with the theoretical expectations of the gravity model namely positive coefficients for economic size (GDP per capita of exporter and trading partners) and negative coefficients for distance.

Ache region of Indonesia coffee export study found out that variable lag of exports, world coffee exports, world coffee prices, exchange rates and consumption stock of importing countries are positively and significantly effects the export demand, while the variable of stock of world coffee exports and revenues of importing countries has a negative and not significant effect. Whereas the variable price of the world has a significant negative effect on the demand for commodity exports of Acehnese coffee in the international market (Ismail et al., 2017).

A study on Sudan sesame seed exports sector, using VECM, by Yousif (2015) showed that low yield, area variation and unstable fluctuating exchange rate are the main factors affecting sesame export earnings in the long run, and area variation in the short run. Improvement of sesame yield and stabilized exchange rate will have positive impact on sesame export value in the long run.

In a study of import and export impact on GDP of Egypt, using ARDL approach, Sulaiman et al. (2019) found out that Egypt has a long run relationship with export, import demand, economic growth, prices of exports and imports, and volatility of an actual effective exchange rate in the market. Therefore, the imports and exports in Egypt are affected by the country's GDP. Hence it is growth driven.

The long run relationship between GDP and exports also show the important of export for economic growth. In a study on Japan, South Korea and China export performance and economic growth using VAR/VECM econometric time series analysis, Malhotra and Kumari (2016) found out that export led growth is long run phenomena, hence the need to continue to promote exports.

Kargi (2014) in a study on 'Time Series Analysis about the Relationship between Foreign Trade and Exchange Rate in Turkish Economy' found out Exchange rate and export, import and net foreign trade in Turkish Economy are co-integrated in the long-term. There is one-directed causality from exchange rate to export, import and net foreign trade.

Ogbokor and Meyer (2016) in a study on 'An Econometric Time-Series Analysis of the Dynamic Relationship between Foreign Trade and Economic Growth in a Developing Country: Evidence from Namibia' found out that co-integrating relationships were found amongst the variables used in the study, implying a long-run relationship amongst these variables. Lastly, the study found that exports indeed Granger-cause economic growth.

Rahman (2003) study on Bangladesh foreign trade using gravity model found out that the major determinants of Bangladesh's exports positively are: the exchange rate, partner countries' total import demand and openness of the Bangladesh economy.

Though based on total trade balance, Irhan et al. (2011) in a study of Turkish trade balance using ARDL bound test approach found out that real exchange rate depreciations improves the trade balance in a strong and significant way, that domestic real income affects the trade balance negatively, and that trade balance is strongly improved due to an increase in foreign real income.

In a study on impact of international trade on Nigeria's economy, Owolabi-Merus et al. (2015) found out a long run relationship existing between international trade and economic growth in Nigeria. The Ordinary Least Square results suggest that export is positively associated with economic growth while imports connotes otherwise.

In a study on exports and economic growth in Ethiopia by Debel (2002) using ECM found out that export growth positively and significantly affected economic growth. On the other hand, the impact of foreign income was found to be insignificant on merchandise exports, while it showed a significant and negative impact on manufacturing exports.

A study on Export performance and its determinants for Ethiopia by Sisay (2010) based on co integration method found out that The two models estimated depict that merchandise export volumes are significantly influenced by gross capital formation (proxy for production capacity) and share of trade in GDP (proxy for trade liberalization) while other variables; terms of trade, real effective exchange rate, foreign income, and foreign direct investment were found to be insignificant. Real exchange rate had a negative coefficient, and elaborated this to the presumably price inelastic domestic supply and foreign demand.

That is though based on total merchandize export as having positive effect while, for manufacturing export, foreign income and exchange rate have negative effect.

On the relationship of trade liberalization and economic growth in Ethiopia, Yesedaw (2017), using VECM model, found out that there are both short-term and long-term relationships between liberalization and economic growth. More specifically, trade openness has had a positive and significant impact on the economic growth of Ethiopia. Therefore, the government of Ethiopia should integrate and open the economy.

A study on determinants of textile and apparel export from Ethiopia by Yared (2010) showed that labour cost and trade openness (liberalization) have positive impact on the export performance of the sector, whereas cotton export and exchange rate have negative impact.

In a study on the macro-economic determinants of the Tunisian economy, Masmoudi and Charfi (2012) found out that the effect of exchange rates on exports is significantly negative.

In the study on determinants of cotton and tobacco exports from Zambia, based on ARDL model, Mabeta (2015) found out that there is co integration of exports to explanatory variables and short run and long run significant relation with specific explanatory variables (based on p-value). The study revealed that cotton and tobacco exports are co-integrated with foreign direct investment, real effective exchange rate, real Gross Domestic Product (GDP) of trade partners, real interest rate and world price. The ARDL analysis revealed that cotton exports are affected by the real interest rate, real effective exchange rate, world price and the real income of the trading partner in the short-run. In the long-run, cotton exports are affected by real interest rate, real effective exchange rate and real GDP. Tobacco exports are significantly affected by real effective exchange rate, real income of the trading partner and foreign direct investment in the short-run while only real effective exchange rate and the real income of the trading partner affect the growth of tobacco exports in the long-run. Granger causality tests revealed that cotton and tobacco exports granger cause agricultural share of GDP. Overall, both exports are highly elastic to exchange rate movements and the importer's GDP.

Wondwosen (2014), in his study of 'A Panel Data Analysis for Bilateral Trade of Ethiopia and East African Community countries' found out that GDP, per capita GDP difference, Nominal Exchange Rate, Inflation and Distance between the Trading Countries from Ethiopia found to have the assigned magnitude and significant impact on Ethiopia's bilateral Trade. The export potentials of the country are estimated using the estimated coefficients of the gravity model. Accordingly, Ethiopia has the highest unexploited potential in EAC and significant amount in the determining variables by the size of the bilateral economic, Nominal Exchange Rate, Trade Policy of the country and Distance between the Trading Countries and Ethiopia.

In a study on real exchange rate effects on exports in Ethiopia, using panel data gravity model, Kebede (2011) found out that both lagged and current real exchange rates are not in a position to exert significant effect on the bilateral exports of the country, in all the three export categories under consideration. The implication is that complementary measures are required to gain competitiveness in international market; thus diversifying exports from traditional primary commodities to nontraditional price elastic export items, expanding exports destinations and giving due attention to the quality of exports are reasonable options.

Moyi and Kimuyu (1999) in their study on the export of Kenya found out that real exchange rate is critical here, since a real depreciation most likely increases not only the volume of exports but also the share of production going to exports.

A different result to expectation was also found in a study on Germany's exports, where export was not affected by distance and REER appreciation. Paulus et al. (2014) in their study on German International Trade: Interpreting Export Flows using the Gravity Model found out that German exporters are more prone to expand the trade to countries that are more distant from their European neighbourhood relative to the world average. Exports are sensitive to both the real exchange rate movements and the price levels of partner countries, even though their elasticity is significantly less than unity, which suggests that German exports would not be impacted very much if the Euro appreciated in real terms; in which the position of the Euro in German trade seems to be rather ambiguous since not all tests revealed its role as a catalyst.

Hatab et al. (2010) in their study on Determinants of Egyptian Agricultural Exports: A Gravity Model Approach found out that the findings are that a one percent increase in Egypt's GDP results in roughly a 5.42 percent increase in Egypt's agricultural export flows. Besides, the results showed: in contrast, the increase in Egypt's GDP per capita causes exports to decrease, which is attributed to the fact that an increase in economic growth, besides the increasing population, raises the demand per capita for all normal goods. Hence, domestic growth per se leads to reduced exports. The exchange volatility has a significant positive coefficient, indicating that depreciation in Egyptian Pound against the currencies of its partners stimulates agricultural exports. Transportation costs, proxied by distance, are found to have a negative influence on

agricultural exports. These results are important for trade policy formulation to promote Egyptian agricultural exports to the world market.

Yeshineh (2010) in the study Determinants and Potentials of Foreign Trade in Ethiopia: A Gravity Model Analysis found out that the major determinants of Ethiopia's exports are: size of the economies (GDP's of Ethiopia and that of partner), partner countries' openness of economies, economic similarity and per capita GDP differential of the countries. All these factors affected Ethiopia's export positively except similarity indicator. The exchange rate, on the other hand, has no effect on Ethiopia's export trade. Also, transportation cost was found to be a significant factor in influencing Ethiopia's trade negatively.

A study by Alleyne (2014) on A Gravity Model approach to analyzing the trade performance of CARICOM member states found out that per capita GDP differential, trade to GDP and language all impact trade positively. On the other hand, geographical distance, exchange rate and unexpectedly, historical trade relationships have negative effects on trade. The results suggested that management of the exchange rate is critical and that CARICOM countries may be served better by trading with countries with higher living standards.

Negussie and Deslaegn (2014) in their study on Determinants of Bilateral Trade between Ethiopia and Its Major Trading Partners': A Gravity Model Approach found out that the total trade flow was determine by mass (economic size) of the importing and exporting countries, real bilateral exchange rate, FDI of Ethiopia, weighted distance and bordering between Ethiopia and the major trading parents. results of this study indicated that a depreciation of the real exchange rate would affect the international competitiveness of Ethiopian exports, therefore, the study recommended depreciation of a country's real exchange rate because it will cause a gain in competitiveness of that country; and government needs also to pay adequate attention to destination markets with cheaper transport costs.

Hailegiorgis (2011) in his study on Export performance of oilseeds and its determinants in Ethiopia found out that real output and nominal exchange rate have positive brunt/significant influence on the export performance of oilseeds in Ethiopia.

Moreover, Benkovskis and Wörz (2013) noted that increases reflect real appreciation, so they are associated with losses of international competitiveness.

5.3 Summary of studies on other factors affecting export trade & competitiveness

Beside the factors studied as affecting export trade of sesame seed, a number of export trade and competitiveness related studies have also identified yet other factors that are crucial in affecting export trade performance and competitiveness. These factors include trade facilitation, transport and trade logistics performance, and other export enabling environment, customs management, export documentation, processes and procedures, time for export, cost of export trade, technical barriers to trade, sanitary and phytosanitary measures, trade and other relevant quality of institutions, and logistics performance indices, etc …, and other 'behind the border' constraints. Some of the relevant empirical studies in this respect are reviewed briefly below.

A World Bank report on Ethiopia (2014) argues in the long run what really matters for exports to strive is productivity and quality, in which Ethiopia's regimes for standards and certification are inadequate. Besides, the World Bank (2011) also advocated for undertaking complementary elements for competitiveness, namely, the incentive framework (to support firms that can compete internationally), reducing trade related costs (on physical infrastructure, complementary services, supply of capable labour force and other policies), and also overcoming market and government failures (through institutional quality, transparency, innovation, export promotion, …).

Felipe and Kumar (2010) in their study on the role of trade facilitation in Central Asia, using a gravity model, found out that there are significant gains in trade as a result of improving trade facilitation in these countries. Greatest increase in total trade comes from improvement in infrastructure, followed by logistics and efficiency of customs and other border agencies.

On standards, regulations, harmonizations for exports, Herman et al. (2018), in their study on Competitive Conditions Affecting U.S. Exports of Medical Technology to Key Emerging Markets found out that export competitiveness is tied to regulatory measures (lengthy time-to-market and regulatory complexity)rather than demand factors.

Braha et al. (2017) in their study on Determinants of Albanian Agricultural Export: The Gravity Model Approach found out that bilateral institutional distance has diminishing effects on Albanian agricultural exports.

On determinants of the export competitiveness of the tea industry of Sri Lanka, Sachitra (2014) found out that Factor conditions, demand conditions, government support, brand loyalty and related and supporting industries can help to sustain competitive advantage. Raw material, technology, physical infrastructure, information infrastructure, related industries, and firm characteristics have significant impact and hence need to be given priority and develop appropriate strategies.

ESCAP (2009b) study on 'impact of trade facilitation on export performance in the Asian sub region' found out that delay in export performance and trade facilitation in general hampers export competitiveness in the Asian sub region.

It is also important that other variables, not included in the models, be given appropriate attention, given their role in promoting comparative and competitive advantage in exports, of which trade facilitation requires particular attention. For instance, a study by Spence and Karingi (2011) showed that while the quality and quantity of physical infrastructure is robust across specifications, the results suggest that trade facilitation measures are best adopted as part of a holistic trade policy aimed at creating an environment conducive to the diversification of African exports to ensure long run export competitiveness.

Besides, Miran et al. (2013) in a study on Raisin export using extended gravity model, found out that increase in foreign trade; increase in world welfare, uninterrupted increase in population will contribute to the sustainability of the countries' export of raisin; while cross countries distances negatively influence the raisin export; and need for developing pricing strategies or put different products on the market such as organically grown raisin; and need to tap the benefits and increase possibilities of transporting via sea lines; technology, globalization, privatization, lifting of the trade barriers and softness in import/export regulations are the major factors, which affect international trade.

Moreover, using modified gravity model for India, Kalirajan and Singh (2007) found out that India's export performance is still far behind that of China, and the need to intensify India's reform measures /by relaxing 'behind the border constraints/ to catch up and to overtake China.

5.4 Discussion on Ethiopia's sesame seed export potential results

The implication of the export potential estimates showed that with a total export potential of 1.1 billion USD and actual exports of 371.7 million USD, and current export to potential percentage share of 32.7%, there is significant potential to expand exports of sesame seed. Besides, Ethiopia's untapped potential remaining in individual importing countries adds up to 763.2 million USD. This untapped potential is 2.05 times the current sesame seeds export value of the country, which means that Ethiopia can more than double its current export value of sesame seeds.

Besides, in relation to other African regional competitor countries, Ethiopia has relatively higher untapped potential as compared to the African and other global competitors.

Finally, Ethiopia with a total export potential of 1.1 billion USD, and actual export value of 371.7 million USD, and a utilization rate of 32.7% only, has major opportunity to tap the remaining huge potential of (100-32.7%=67.3%), by carrying out export potential country international market research, studying import market requirements, quality standard, certifications and other requirements of existing and new end markets, and by further upgrading and maintaining its current comparative advantage and competitiveness in sesame seeds and other value added products from sesame seeds.

CHAPTER SIX: CONCLUSIONS & RECOMMENDATIONS

6.1 Conclusions

This study made a depth review and analysis of the sesame seed export sub sector of Ethiopia and analyzed the major and relevant issues pertaining to Ethiopia's sesame seeds export performance, comparative advantage and competitiveness.

Regarding **Objective 1**, on analysis of the sesame seed export performance of Ethiopia, the study was able to find out that sesame seeds is an important oilseed crop export commodity of Ethiopia, accounting for more than 80% of Ethiopia.

Ethiopia's has been exporting more than 60% of its sesame seeds export to just one destination (China), followed by Israel, while there are also other destination countries with relatively smaller market shares. Consequently, sesame seed export of Ethiopia has had a higher overall export concentration ratio of 0.**33**, far higher than the world average of 0.**11**, pointing to the need to take precautionary measures towards diversifying the export destination markets. It has also been observed that some of the importers of sesame seed from Ethiopia such as the Netherlands and Japan do offer higher export price (as measured by unit values), may be for a further cleaned or processed, and higher quality or certified export of sesame seed, which points to the need to export high quality, and also de-hulled, certified sesame seed, with the opportunity to earn a premium export price.

Regarding **Objective 2**, as compared to other major sesame seed producer and exporter countries in the African region, Ethiopia has had a higher Revealed Comparative Advantage (RCA), revealing the existence of favourable factors conditions for the production and export of sesame seeds. In fact, Ethiopia's RCA has been higher only exceeded at different intervals by the leading exporter in the African Region, i.e., Sudan. However, it needs to be emphasized that though Ethiopia's RCA has been higher, it has been characterized by very erratic upward and downward movements, and more importantly, with recent trend in 2018 showing a declining RCA. This points to the need to carry out continued reforms and adjustments in the farm to market chain of

sesame seeds to boost comparative advantage and competitiveness of Ethiopia's sesame seeds in the international market place.

Moreover, examination of the end market/import trading partners and global developments regarding sesame seeds imports has been conducted. Accordingly, though Ethiopia's export is concentrated mainly in China, China's import concentration ratio reveals a completely different result, i.e., it rather shows a very low 0.18 import concentration ratio, which means that Ethiopia is not a predominant supplier to the Chinese market, but one among many other exporters. This certainly has serious implications on the stiff competition ahead as China, a major import trade partner, has well developed import trade relations with Ethiopia's major competitor countries for export of sesame seeds. On the other hand, for the other important trading partner to Ethiopia, i.e., Israel, has a very high import concentration ratio of 0.67, i.e., its supplying countries are dominated by few exporting countries.

Regarding **Objective 3**, which analysis the factors affecting the export performance and competitiveness of sesame seed export from Ethiopia, the ARDL econometric model has been used, with regressions run for two equations, one with export value of sesame seed and another with export volume of sesame seed as dependent variables, with the independent/explanatory variables being GDP of Ethiopia, Export price to Producer price ratio, Real effective exchange rate, and import trading partner countries' export share weighted GDP per capita.

Accordingly, after carrying out the stationary of the variables by ADF unit root tests, and the bound co-integration tests that gave existence of long run relationships among the variables in the study, the results of the ARDL model for the two equations shows that there is long run relationship between sesame seed exports value as well as volume to the above indicated explanatory variables, with GDP of Ethiopia positively and significantly associated with sesame seed exports value as well as volume dependent variables. Export price to producer price ratio has shown negative and statistically significant results mainly due to the major feature of commodities exports from developing countries, which are characterized by declining terms of trade, in which primary commodities exports from developing countries are acting as 'price takers' in the international market place. The Real effective exchange rate for major trading

partners shows negative and statistically significant results, as despite the continued national currency (Ethiopian birr) devaluation, the real effective exchange rate has been showing rising trends, ultimately negatively impacting possible increase in export of sesame seed value as well as volume. In relation to this, given the raw or primary commodities nature of the export of sesame seed from Ethiopia, unlike manufacturing exports, the responsiveness of exports value or volume to the real effective exchange rate, is dampened than would be the case for manufacturing exports, which has relatively faster supply response.

Besides, the import demand (as represented by major trading partners export weighted GDP per capita) exhibited negative but statistically significant results, implying that the export of sesame seed from Ethiopia, though a major export commodity for the country, is likely that the sesame seeds export may not be a major import component for the major importing countries, such as China, Israel, or the other importing countries. This is because the available literature also elaborates that more advanced or emerging developing and also developed economies import heavily highly processed, technological and sophisticated products.

Concerning **Objective 4**, the study has found out that there is major export potential that Ethiopia could tap in existing as well as other currently less important export destinations of Ethiopia. So, the results of the study show as compared to the overall export potential, Ethiopia's current export is about 33%, with major export potential gaps to be met in the leading export destination, China, Israel, but also the other destination countries as well.

In relation to the export of natural sesame seed, which is currently the case from Ethiopia, export of high quality, branded and certified or further processed (de-hulled) sesame seeds need also be an area of concern as there is huge increase in export prices to be obtained from such exports, to the extent of a premium of 30%.

Moreover, given the huge import of edible oil in to the country, with an import bill of about 500 million USD in 2018/19 (USDA, 2020), requiring the government to allocate huge foreign exchange, and domestic price support budgets, it is high time that the country exert efforts towards increasing domestic sesame seeds and other oilseed crops production area, varieties,

yield/productivity (from its current 8 quintal per hectare), quality and agricultural extension and research as well as marketing stage activities, in order to create a favourable condition for the use of sesame seeds and other oil seed crops to boost not only exports, but also avail the oil crop raw material inputs for the processing of edible oil by the domestic edible oil processing industry, which is currently in its very weakened state.

6.2 Recommendations (and Strategies for Action)

Ethiopia has exhibited, though in an erratic manner, higher RCA than many African regional sesame seed exporters; however, such a higher RCA is not a guarantor of future comparative advantage.

Given the diverse nature of the sesame seed sub sector constraints, there is a need to exert multifaceted efforts in different directions to promote the comparative advantage and competitiveness of sesame seed export from Ethiopia. Added to this is the volatility in demand, supply and also price in the international sesame seed market.

Thus, for promoting and also enhancing the comparative advantage as well as competitiveness of Ethiopia's sesame seed exports and in order for the sesame seed sub sector play its catalytic role as an engine of economic growth, and toward national, regional and local economic development, diversification and transformation efforts, the study recommends: expansion of sesame seed production & yield through extensification and intensification strategies, including introducing and scaling up use of high yielding and esp. non-shattering varieties of sesame seeds; engaging in export market/product development & diversification through value addition in sesame products and engaging in export market diversification and development strategies based on the import potentials estimates, and also by doing B2B linkages, trade diplomacy, and related export promotion strategies; addressing domestic sesame seed and related cost push factors through implementation of appropriate support and incentives to the farm to export chain investment and trade logistics related support and incentives, including improving the ECX trading system to enhance value chain linkages; addressing misalignment in exchange rate & the appreciating REER through implementation of realistic and stable exchange rate of the national currency; developing and maintaining a highly competitive sesame seed professional exporter

class through reducing the export business entry and exit barriers and also addressing the sesame export business enabling environment challenges; implementing product traceability, quality, differentiation through implementation of quality certifications (including organic certifications, geographic indicators, …) and branding and better positioning of the Ethiopian sesame seed varieties in the global market place.

Hence, there is a need to apply the above outlined recommendations and strategic interventions in order to tap the huge potential of Ethiopia's sesame seeds (& oil seed crops) sub sector so as to spur the role of natural sesame seed and value added sesame seed products export trade as well as serve as a dependable raw material supply source for the significantly weakened domestic edible oil processing sub sector, thereby playing a catalytic role as an engine of economic growth, poverty reduction, household food security and livelihoods and towards national, regional and local economic growth & development, diversification and transformation.

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