



Factors affecting the coffee export competitiveness of Ethiopia: Time series analysis

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Declaration

I, Biftu Mohammed Hassena, hereby declare that the thesis entitled “Factors affecting the coffee export competitiveness of Ethiopia- time series analysis” is exclusively the result of my own work and has not been submitted, in whole or in part, in any prior application for any degree or professional qualification. References used are acknowledged in the literatures and resources.

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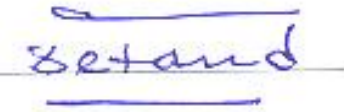
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Thank you.

Abstract

The aim of this study involves Ethiopia's competitiveness on coffee export and the factors affecting it through the period of 1993-2022 observation. In this study Revealed comparative advantage were employed to explain the level of comparative advantage and Revealed symmetric comparative advantage were employed to assess the level of Ethiopia's competitiveness on exporting of coffee. To capture the factors and determinants of coffee the approach used is ARDL model with Johansen co-integration test to investigate the long run and short relationship between the coffee export competitiveness with domestic production of coffee, world production of coffee, world price of coffee, foreign direct investment inflow stock, the real effective exchange rate, and the total volume of coffee export. As a result, the approach explains that there is both short run and long run relationship between the competitiveness and the explanatory independent variables. The analysis pointed out that in the long run the extent of domestic production of coffee and total export volume is significant and positively affecting the competitiveness. However, world price of coffee, and the real exchange rate have significant and negative effect to the competitiveness. But the FDI and world production of coffee is insignificant and negative effect to the competitiveness. On the other hand, in the short run the domestic production of coffee has a significant and positive effect to the competitiveness. And world production of coffee, world price of coffee, and the real effective exchange rate has significant and negative effect to the competitiveness. The FDI has negative and total export volume has positive effect but insignificant effect on the short run.

Keywords: RCA, RSCA, Coffee export competitiveness, ARDL

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List of Acronyms

ARDL	Autoregressive Distributed Lag
CSA	Central Statistical Agency
ECX	Ethiopian Commodity Exchange
ELG	Export Led Growth
FAOSTAT	Food and Agriculture Organization Statistics
FDI	Foreign Direct Investment
GDP	Growth Domestic Product
ICO	International Coffee Organization
ITC	International Trade Center
NBE	National Bank of Ethiopia
RCA	Revealed Comparative Advantage
REER	Real Effective Exchange Rate
RSCA	Revealed Symmetric Comparative Advantage
UN-COMTRADE	United Nation Commodity Trade
UNCTAD	United Nations Conference on Trade and Development
USDA	United State Department of Agriculture
WTO	World Trade Organization

Chapter one

1 Introduction

1.1 Background of the study

Opportunities in the global world are extremely different and varied, these differences are reflected in their location advantage, factor endowment advantage, technological advantage, human capital advantage, and condition effects. The linkages of exports to growth and poverty reduction will also differ, in some cases operating mainly through employment and learning effects at the firm and industry level, in others through expanded financing for public infrastructure or imported capital equipment, and in others through the use of export promotion to achieve focused improvements in public services and the business environment (Biggs, 2007).

An economy's ability to grow is influenced by exporting; yet, while there may not always be solid evidence of export-led growth (ELG), East Asia's exceptional history of high and consistent growth is largely attributed and believed to its quick export market growth. Specifically, the four tigers' growth wave (South Korea, Singapore, Hong Kong, and Taiwan) and developing nations (Malaysia, Indonesia, and Thailand) have been cited to strengthen the claim that trade liberalization through an ELG is a means of attaining rapid economic expansion and growth. (Williams and Giles, 2000). According to the export led-growth report on World Bank (2002), export-led growth had a crucial impact, especially on labor-intensive Asian exporting countries like Taiwan, Indonesia, Thailand, and Hong Kong in the 1970s and 1980s. Likewise, in the 1990s, countries like China, India, Vietnam, and Uganda became more open to international trade and foreign direct investment, which led them to significantly enter the international market and overcome poverty on a large scale. Ethiopia also has to promote and encourage forms of export techniques like international subcontracting agreements and technical agreements.

Export development creates economic integration among different nations, which significantly increases the economic growth and development of the nation. Economic integration also plays a crucial role in developing technological advancements that strengthen the economic development of a nation. As economic integration among nations develops, so does the size of international

trade, which results in the concept of export competitiveness. Having an export competitiveness on a selected item is crucial for a country to promote economic development and sustain in the global competitive market. (Sachitra, 2013).

As international trade size increases, the concept of export competitiveness plays a major role in the international trading system in which the international competitiveness is inclined toward exports (Bruneckiene and Paltanaviciene, 2012).

Latruffe (2010) defines competitiveness as the ability to sell a product or service as per the required demand in terms of quality, quantity, and price and gain profit over time that enables the firm to thrive. It is also the ability to face competition and be successful at it. The competition can be domestic or international. So, competitiveness is a relative measure. Balasaa (1978) explains that countries with high export levels tend to have fast economic growth. Export competitiveness is the driving force for the development of the economy, and export-oriented policies are important for the growth of developing economies.

Next to crude oil, coffee is the second-most traded commodity in the world (UNCTAD 2018). The fact importing countries are giving more emphasis on product differentiation, it is affecting the coffee global value chain to change rapidly. (Ponte, 2002).

Utting (2005) In terms of international trade, coffee is the most valuable tropical agricultural product, in which it is the second most traded commodity after petroleum in the world. Coffee is exceptional in that it is produced in the developing countries and in many of these countries, the foreign exchange earnings from coffee exports has a vigorous significance to the balance of payments and to the economies of the countries as well. Coffee is an important cause of development, generating cash returns in subsistence economies. In addition, the production and harvesting of coffee are labor-intensive, contributing significantly to rural employment for both men and women. As coffee is major commodity for many countries, it determines the wellbeing of the country's economy which gives it vital importance in the global economy

Ethiopia is the birthplace of Arabica coffee and the center of origin for the Arabica coffee plant, so millions of households make their livelihoods from the production of coffee. According to Nure, (2008), there are about different local varieties of coffee grown in Ethiopia, and there is significant potential for increasing coffee output through expanding planted area, increasing the

density of trees per hectare, and increasing the yields per tree. The average coffee farm is only 0.5 hectares, and modern inputs and management techniques are not used. Ninety-five percent (95%) of the coffee produced is organic.

According to the central statistical agency CSA (2022) Report of Meher Season on Area and Production of Major Crops, in the year 2020/2021, a total of 856,529.03 hectares of the country, produced about 5,847,895.6 quintals of coffee and in the year 2021/2022, a total of 794,403.5 hectares were harvested and produced about 5,455,663.58 quintals of coffee were produced.

In Ethiopia the export sector is dominated by the export of a few primary commodities, mainly coffee, oilseeds, gold, chat, flowers, pulses, live animals, and hide skins. According to the report from the Addis Ababa Chamber of Commerce and Sectoral Associations, 30% of the total foreign currency earned by the country is from coffee. Coffee is the major agricultural export crop, which provides approximately 35 percent of Ethiopia's foreign exchange earnings (David and Christian, 2013). Ethiopian coffee contributes 25%–30% of the country's foreign exchange, 5% of GDP, 90% of total exports, 85% of total employment in the country, and is part of the culture; about 50% of the produced coffee is consumed domestically (Alemayehu, 2014).

Coffee is a vital commodity for Ethiopia, and it plays a significant role in increasing and shaping the economy. Promoting coffee exports and improving the coffee sector will have sustainable economic growth for the county. Focusing on the long-term policy on the export of coffee has an impact on the development of the economy. (Berhanu & Hirvonen, 2017).

1.2 Statement of the problem

Ethiopia is the center for coffee Arabica; the altitude, temperature, rain fall, and soil type make the environment very suitable for the production and growth of coffee. The country possesses a very divergent genetic diversity of coffee Arabica types. However, comparing the capability of the country on coffee export, it is not remarkable. (Soressa, 2013).

On the publication of *Unleashing the Potential of Ethiopia's Export Industry*, World Bank (2014) Ethiopia has a comparative advantage to develop the export industries when land, labor, capital, and institutions are the primary strengths as most developing countries have. The fact Ethiopia is among the developing nations, the country mostly relies on extremely modest industrial items and primary agricultural commodities for its exports to the international market. A small number

of extremely volatile agricultural commodities controlled the nation's export industry for many years. Furthermore, Ethiopia's exports are geographically concentrated in a small number of destinations, primarily in European and Asian nations, and are restricted to a small number of key products with least of product diversification.

The country's potential for export earnings and its comparative advantage in marketing mean that the coffee sub-sector's benefit falls significantly short of its potential. Ethiopia sells raw green beans that have not been roasted or decaffeinated. Furthermore, irregular harvesting and post-harvest handling by farmers, fraudulent coffee origin claims made by exporters, and corruption in some coffee cups during the sorting process at the coffee arrival market can all cause minor quality issues that cause differences in the quality of the coffee and the quality level. (Diriba, 2021).

According to ICO (2016), the price of coffee is highly unpredictable and volatile. The consumers will benefit from the low price of coffee, but it affects the procedure and the economic viability of production. Ethiopia is not determining the world's coffee price; rather, it takes the price and accordingly provides the international market as per the price. As a result, supply from other countries like Brazil, causing price volatility, will eventually affect the export competitiveness of the country Belay (2000). The volatilities in export supply are usually defined in terms of short-run deviations around a trend. Earnings that come from exports are earned by supplying for the export, and so if there is volatility in the supply side of the export, then it affects the earnings from the export as a result.

Those countries that are primary producers of export commodities are facing a rise and fall in earnings from the export of primary commodities, partly due to instability in the export supply. It has been argued that a high degree of instability in export supply would imply large fluctuations in the export income of the country in question. Such fluctuations can have a negative effect on the economies of primary commodity-exporting countries (Tadesse, 2015).

In general, the fact that the coffee market in the international market is volatile means that the variables that affect the competitiveness of a nation has to be studied frequently. This study uses a long period of data set for the analysis which helps in achieving in depth of the impact caused by the variables. This study will focus on the current trends and present fiscal year to determine

how and what factors are affecting the coffee export competitiveness of Ethiopia based on the current trends.

1.3 Research question

To conduct this study and accomplish its objective, the following questions have to be addressed:

- To what extent does the domestic production of coffee affect the competitiveness of country in the international market?
- To what extent does the world price of coffee affect the competitiveness of the exporting country?
- Does foreign direct investment affect the coffee export competitiveness of the country in the international market?
- Does the exchange rate influence the export competitiveness of Ethiopia?
- Does the volume of coffee produced around the world affect the competitiveness of the exporting country?
- Does the total volume of exported coffee from Ethiopia affect the competitiveness of the world market?

1.4 Objective of the study

1.4.1 General objective of the study

The objective of this study is to analyze the factors that affect the competitiveness of coffee exports in Ethiopia.

1.4.2 Specific objective of the study

- To examine how the domestic production of coffee has an influence on the competitiveness of coffee exports in Ethiopia.
- To assess the effect of the price of coffee in the world on the competitiveness of coffee exports in the nation.
- To assess the effect of foreign direct investment on the competitiveness of coffee exports in Ethiopia

- To analyze the effect of the exchange rate on the export competitiveness of coffee in Ethiopia.
- To examine the effect of total coffee production in the world on the competitiveness of coffee exports in the country.
- To assess the influence of total volume exported coffee from Ethiopia on export competitiveness.

1.5 Significance of the study

As this study is conducted to identify the factors that are affecting the export competitiveness of coffee in Ethiopia, the result will benefit the coffee exporters to know which factors are more affecting the competitiveness of the coffee export and, therefore, strategically overcome them with solutions.

The beneficiaries of this study will be the coffee exporters and business holders in the sector, policymakers and other government officials on which factor to focus on to increase the competitiveness of Ethiopian coffee in the international market.

Using this study as a reference, the future researchers will benefit by observing what are the limitations on this study and so further analyze those limitations to deeply examine the effects.

1.6 Scope of the study

This study is geographically limited to Ethiopia, as it is limited to analyzing the factors that affect the competitiveness of coffee export in Ethiopia.

This study is limited to analyzing the factors that affect the export competitiveness of coffee in Ethiopia. The study is conducted using a time series data from 1993-2022 emphasizing on the competitiveness of Ethiopia and other top 10 producing and exporting countries of coffee.

In addition, this study is conceptually limited to analyzing the factors that have an impact on the competitiveness of coffee exports in Ethiopia. The study has limited the factors to the exchange rate, foreign direct investment, world coffee production, total coffee export, domestic coffee production, and world coffee price.

1.7 Definition of terms

Export competitiveness: is a country's capacity to sell goods and services in international market while retaining or strengthening its comparative advantage over other exporters i.e. countries. Essentially, it is about how well a country can compete worldwide by exploiting its comparative advantage and removing any impediments to export.

Comparative advantage: it refers to a circumstance in which one country can produce a specific good or service for a lower opportunity cost than others, it's about efficiency in resource allocation.

Relative symmetric comparative advantage: is a measuring of countries comparative advantage in a certain product compared to the global trade. RSCA helps to assess how well a country competes in specific products on a global scale.

1.8 Organization of the paper

This study is structured into five chapters. On the first chapter, the introduction part of the study including the background information, statement of the problem, research question, general and specific objective of the study, significance, scope, and the organization of the study. On the second chapter, it consists of relevant literature and empirical reviews. On the third chapter, it is where the research design and methodology of the study is discussed. The fourth chapter discusses the analytical part and the results with the major findings of the model and the study. On the final chapter, the conclusion, recommendation, and the summary of the study is discussed.

Chapter two

2 Literature review

2.1 Theoretical literature review

2.1.1 Theory of absolute advantage

Absolute advantage is the ability of an individual, company, region, or country to produce a greater quantity of a good or service with the same quantity of inputs per unit of time, or to produce the same quantity of a good or service per unit of time using a lesser quantity of inputs, than its competitors. It explains how countries can benefit from trade by specializing in the selected item in production and export of the item more efficiently than other countries. It explains how countries can benefit from trade by specializing in producing and exporting goods they can produce more efficiently than other nations. (Smith, 1776)

2.1.2 Theory of comparative advantage

Ricardo argued that a country can have both absolute and comparative advantages in the production of a particular product, and by focusing on the product with a greater advantage, it can further improve global output and its own economic well-being. Trade is viewed as a positive-sum game in Ricardo's theory. That a country can maximize its economic well-being by specializing in the production of goods and services it can produce relatively efficiently. This specialization, coupled with participation in free trade, enhances global efficiency. (Ricardo, 1817)

2.1.3 Resource based view

Resource Based View (RBV) analyzes and interprets resources of the organizations to understand how organizations achieve sustainable competitive advantage. The RBV focuses on the concept of difficult-to-imitate attributes of the firm as sources of superior performance and competitive advantage. (Barney, 1986).

2.2 Competitiveness

As cited in Nguyen (2009), national competitiveness is defined as the ability of a nation to, under free trade and fair market conditions, produce goods and services that meet the test of international markets while simultaneously maintaining and expanding the real income of its citizens over the long term. (Porter, 2003). The World Economic Forum (2016) defines

competitiveness as the set of institutions, policies, and factors that determine a country's productivity level. A competitive economy is believed to be the most productive one, which eventually leads to growth.

The productivity that may be attained in an economy would be essentially unaffected by events in other countries if there was no international competition. On the other hand, foreign investment and international trade offer both the chance to raise and sustain the level of national production. A nation can increase its productivity through commerce since it removes the requirement for domestic production of all commodities and services. By doing this, a nation can import goods and services where its companies are less productive than those of its international competitors and specialize in those sectors and industries where its businesses are comparatively more productive. It increases the economy's average productivity in this way. (Porter, 1998)

In order to keep growing economically in the dynamic of globalization, the priority is to maintain the long-term competitive advantage of the economy. These competitive sectors of the economy should keep changing as globalization evolves in the modern era to sustain. Such sustainability comes through an overall development across all sectors, from education, infrastructure, efficient capital markets, and workforce quality to social and political environments. (Ernst and Haar, 2019).

The sector that has the most contribution to the nation's economic development is where the most economies follow their very productive sectors, which may be an agricultural economy, manufacturing, or the service sector, which the nation has an advantage over. This shows that it is not necessary for a country to maintain a base industry for competitiveness but also to progress into new, highly productive sectors. Indeed, as the economy is dynamic, there will be sectors that cannot evolve with it, and it is logical for such industries to seek a respectable exit. To keep the economy developing and maintaining its edge, governments should advance and divert their resources to emerging industries rather than striving to salvage those that are falling behind. (Ernst and Haar, 2019).

It is necessary to know what the home country's relative competitive position is, which can be viewed as the position the country has in the international market compared to those countries

that have equivalent economic development; to provide firms with the necessary opportunities to survive and realize the global competitive advantage they have over others. (Önsel et al., 2008)

The efficiency of a nation's public institutions, the excellence of its educational, health, and communication infrastructures, as well as the nation's political and economic stability, are among the factors that affect the capability of a firm to survive and have a competitive advantage in the international market. On the other hand, a high level of national competitiveness is not guaranteed unless firms create valuable goods and services with the same measure of high productivity at the micro-level. Therefore, the micro and macroeconomic characteristics of an economy jointly determine its level of productivity and competitiveness. (Önsel et al., 2008)

Exposure to international competition, via trade and investment, has created an opportunity for a nation to improve local productivity, expand the most productive local industries, access more advanced knowledge and technology from abroad, and expose local companies to higher levels of competitive pressure. Measures related to locational advantage and its cost are also another view of competitiveness; work on cost competitiveness has various interpretations. Low labor costs are viewed as an indication of competitiveness, resulting in decreased unemployment, higher exports, and increased FDI. The competition discussion has revolved around three concepts: market share, cost, and productivity. When the term "competitiveness" first emerged in the 1980s, the public debate in the United States was dominated by concerns about Japan's seemingly inexorable economic growth. Competitiveness was linked to decreased labor costs and regulations that assisted businesses in gaining market share and outperforming competitors on the global stage. A country could only increase its competitiveness at the expense of another country. (Porter et al., 2012)

2.3 Measurement of competitiveness

The evolution of the global economy has led the aspect of competitiveness analysis to narrow down from a macroeconomic to a microeconomic view, which has also led to a shift in focus to the individual and organizational levels. Recent economic developments, particularly the 2008 financial crisis, have highlighted the actions of individuals and businesses, which, combined with strategies and policies centered on short-term profitability and competitiveness, have resulted in an economic, environmental, and ethical global crisis. This suggests focusing on how to attain a long-term competitive advantage to sustain competitiveness. This being said, to have sustainable

development for individuals and society, the business approach model that has been used, which eventually becomes unsuitable with the evolving economy, needs to be replaced by new approaches that lead to harmonious development. Consequently, there is an acute need to address long-term competitiveness in the context of sustainable development of enterprises and society, knowing that generally the microeconomic approaches refer to short-term competitiveness and the national ones are still in debate. (Pelinescu and Dospinescu, 2013)

Among many major indicators of competitiveness for a particular group of countries, export performance is believed to be one. This group is typically represented by developed yet small economies whose economic growth is primarily determined by exports (e.g., Luxembourg, Ireland, the Netherlands, countries of the Visegrad Group, etc.). In a globalized world, dependency on the external environment has its own risks, but they cannot be avoided. Minimizing them is very possible. This primarily occurs on the cycle that appears true but lacks proof and emerges with the functioning of the global economy. In this context, successful adaptation becomes possible when suitable economic and political policies and strategies are applied to the inherited and gained comparative advantages simultaneously supported within a solid institutional environment, such as benefits in terms of qualitative and legislative factors based on the principles of transparency, democracy, and the elimination of opportunism, i.e., the elimination of the promotion of exclusive self-interest, even if it In this context, both formal and informal institutions are key components in achieving competitiveness, a view that has been supported by renowned world institutions (global competitive index) which measure competitiveness via multi-factor indices while also including institutions in their evaluations. (Ruzekova et al.,2020).

The competitiveness of exports will help the nation facility greater market shares, sustain a higher level of revenue and income, and have a high employment rate in the various sectors of the economy. Export competitiveness involves measuring international share, diversifying the export market, sustaining a high rate of export growth, upgrading the technology and skills that can be gained through export and/or investment, and encouraging domestic firms to enter the international market to have exposure to and benefit from the global market and compete internationally. (Nogami, 2008). Exports are critical to a country's competitiveness; expanding the market to the rest of the globe will eventually raise export earnings, and a country with a

diverse export structure can be called competitive. International competitiveness generally refers to a country's capacity to increase its share in domestic and global markets. As a result, international commerce may be the motor that propels nations' economic progress, while international competitiveness serves as the gasoline that powers that engine. (Krugman, 1994).. Exports are frequently associated with a country's international competitiveness on the global scale. Export competitiveness can involve a wide variety of aspects that enable the country to produce and sell quality goods in foreign markets at prices that ensure the sustainability and long- term relationship. (Olyanga et al., 2022).

One of the most significant things that could encourage the growth of the national economy is exporting. Increased export competitiveness might help in the nation's recovery from the consequences of the financial crisis and promote the growth of the entire economy.

(Bruneckiene and Paltanaviciene, 2012).

Reveal Comparative Advantage (RCA), Export Competitiveness (XC), Reveal Symmetric Comparative Advantage (RSCA), Net-Export RCA, Modified RCA (RCA*), Real effective exchange rate (REER), Global Competitiveness Index (GCI), Baltic States Export Competitiveness Index (BalECI), Michaely Index (MIij), Contribution to Trade Balance (CTB), Business Competitiveness Index (BCI), Manufacturing Export Competitiveness Index (MECI), and doing business index (DBI) are among the measures of competitiveness that are developed more specifically the export competitiveness.

2.4 Coffee in a global market

The world's most traded and extensively consumed commodity is coffee. Eighty percent of the world's coffee is produced by up to 25 million farming households worldwide. Coffee is a tropical crop. Coffee is mostly produced in developing countries, where it contributes significantly to export revenue and is a major source of income for households. Brazil, Vietnam, and Colombia are the three nations that produce the most coffee, while the United States and the European Union are the two biggest importers and consumers of coffee worldwide. Due to the fact that coffee is becoming more and more consumed worldwide in emerging economies, there is a greater demand for specialty coffee and new product innovations in established nations.

Despite the expansion of the sector, recurrent and detrimental market imbalances and asymmetric income distribution among market players can threaten the livelihood of millions of smallholder producers. (FAO 2024)

Any international theory's primary goal is to explain the pattern and causes of global trade; however, many theories of international trade hold that liberal trade is beneficial, which is why, according to the global structure of coffee development, over 90% of green coffee production and exports occur in developing nations. These theories also seek to explain why countries take action. Factor abundance theory indicates that Latin American nations such as Brazil, Colombia, Peru, Honduras, and Guatemala produce the majority of the world's coffee (52.13%), followed by African nations such as Ethiopia and Uganda (6.5%) and Asian nations such as Vietnam, Indonesia, and India (22.56%). (Diriba, 2021)

Coffee is exported at an early stage of the value chain, and the value added to the exported coffee in the producing country is very little. Because of this, the coffee industry is generally concerned that an extended period of low coffee prices may have an adverse impact on the supply of premium coffee beans and may have a severe impact on household earnings in coffee-growing regions. Therefore, particular policies must be developed to address the problem of the coffee industry's economic sustainability, stabilize the supply moving forward, and allow producers to get fair compensation. (FAO 2024). Most of the coffee-producing regions tend to have a low economy; in order to make a short-term profit, these regions struggle with cutting corners as poverty hits the areas. When the price set by the ICO becomes low, it puts the living of coffee producers at risk in many producing countries, and it will also become the concern for the economic viability. Since March 2015, the ICO composite price has been consistently below the 10-year average of 137.24 US cents per pound. (ICO 2015).

The total world coffee exports are summed to 12.62 million bags in January 2024, compared with 9.54 million in January 2023. The export in the first 4 months of the coffee year 2023/24 increased by 13.1% to 45.13 million bags, compared to 39.89 million bags in the same period in 2022/23. In the twelve months ending January 2024, exports of Arabica totaled 76.59 million bags, compared to 79.14 million bags the past year, whereas Robusta exports totaled to 51.56 million bags, compared to 48.19 million bags (ICO 2024).

2.5 Ethiopian coffee industry

David and Christian (2013) Ethiopia major export commodities are a few primary commodities, mainly coffee, oilseeds, gold, chat, flowers, pulses, live animals, and hide skins. According to the report from the Addis Ababa Chamber of Commerce and Sectoral Associations, 30% of the total foreign currency earned by the country is from coffee. The major agricultural export commodity is coffee, which provides approximately 35 percent of Ethiopia's foreign exchange wages. (David and Christian, 2013). Ethiopian coffee contributes 25%–30% of the country's foreign exchange, 5% of GDP, 90% of total exports, 85% of total employment in the country, and around 50% of the produced coffee is consumed domestically (Alemayehu, 2014).

Ethiopia is first in a row on the production of coffee in Africa and fifth bulk exporter of coffee in the world. Of the total export earnings, coffee as a commodity generates 30%–35% of export revenue in Ethiopia, which accounts for the commodity as the number one source of export earnings for the country. All the coffee produced in Ethiopia is of the Arabica variety. In the year 2023/24, total production is forecast to be 8.35 million 60-kg bags. The fact many livelihoods depends on the coffee production in Ethiopia, the coffee industry is the driving force behind the country's economy, socio-cultural life, and spiritual life. Post Addis estimates Ethiopia's coffee production for the year of 2022/23 to reach 8.27 million 60-kg bags. (Tefera, 2023)

In Ethiopia the production of coffee is believed to be organic, and coffee is harvested from different system of production. Namely forest coffee, semi-forest coffee, garden coffee, and plantation coffee (Ministry of Trade 2012).

Forest Coffee: The main locations of this production system are in Bale, West Wolega, Metu, Keficho-Shekicho, Bench-Maji, and Jimma in South and South-Western Ethiopia. *Coffea arabica*, or Arabica coffee, is said to have originated in these regions. This variety of coffee is not farmed on purpose. Ten percent of the country's output comes from this production system.

Semi-Forest Coffee: This production system, which accounts for 35% of Ethiopia's total coffee production, is also present in the country's southwest and south-central regions. Compared to trees grown under the forest coffee production technique, trees under this system receive comparatively more sunlight. It entails farmers pruning and choosing forest trees to ensure enough shade while also making space for enough sunshine.

Garden coffee: The South and North Omo, Hararghe, Gedeo, Sidamo, Wolega, and Gurage zones are the primary locations of this production system in the country's southern and eastern regions. It's close to growers' homes and contributes almost half of the country's total production.

Plantation coffee: Plantation coffee, which makes about 5% of the country's output, is cultivated on both well-managed smallholder coffee farms and state-owned plantations, some of which are currently being privatized. (David and Christian, 2013)

In the marketing year of 2021/2022, the share of Germany was 20% which purchased 57,631 tons of coffee for USD 262,614,628, the share of Saudi Arabia was 13.7% by purchasing 39,757 tons of coffee for USD 176,237,893, share of Japan was 10% which purchased 29,375 tons of coffee for USD 134,715,128, the share of USA was 9.3% by purchasing 27,058 tons of coffee for USD 183,534,212 and, the share of Belgium was 8% which purchased 23,188 tons of coffee for USD 135,629,029. For the marketing year of 2022/23 coffee exports are estimated at 4.831 million bags (289,873 MT). (Tefera 2023, USDA)

2.6 Empirical studies

Gönül & Yusuf (2016) have conducted empirical research to examine the determinants of export competitiveness in the manufacturing sector for the OECD countries which have a share in exporting a manufactured item. The researchers conducted a study with 12 countries of OECD and an observation of 12-year (1999–2011) data set with six explanatory variables, those variables include, the effects of physical capital, labor costs, infrastructure, R&D, the share of high-tech exports, and FDI inflows on the export competitiveness of manufacturers. To test the competitiveness of the manufacturing sector in the countries, the researchers calculated the RCA index, and to test the effect of the explanatory variables, they used panel data random effect model techniques. The results of their analysis suggest that the independent variables like physical capital, labor costs, and infrastructure, determine the export competitiveness of manufacturing sector in OECD countries. In addition, FDI inflows into the manufacturing sector have not contributed positively to the export competitiveness of OECD countries in the last decade. On the other hand, the variables like R&D and the share of high-tech exports have shown positive effects on the export competitiveness of the manufacturing sector.

Vilani (2014) conducted a study on the determinants of the export competitiveness of the tea industry in Sri Lanka. The study has included perspectives from export competitiveness, the

resource-based view of the firm, local and foreign demand conditions of the firm, association with related and supporting industries, government sources, and brand loyalty. To conduct the research, a quantitative research method of approach was used to collect the data, and Porter's diamond model with some adaptations was used. To collect the primary data, researchers used an email survey. To analyze the impact of each variables the researcher used the partial least squares structural equation model (PLS-SEM). As a result, the analysis of the study shows that factor conditions have the most significant effect on the export competitiveness of the tea industry in Sri Lanka. The variables like Government support, demand conditions, and brand loyalty have also had a had a positive impact on the export competitiveness of tea in Sri Lanka. The researchers suggested that by giving priority to those elements that have a significant factor, i.e., raw materials, technology, physical infrastructure, information infrastructure, related industries, and firm characteristics, strategies should be developed to enhance the competitiveness of Sri Lankan tea exports and remain competitive in the global world.

Diriba (2021) piloted a study on the determinants of coffee export and the competitiveness of Ethiopia by the period of 1990–2018. Ethiopia, as the birthplace of coffee Arabica, has a comparative advantage in coffee exports, but its share in the international market is low. The researcher used revealed comparative advantage (RCA) and revealed symmetric comparative advantage (RSCA) to explain the comparative advantage and competitiveness of Ethiopian coffee exports, respectively. The researcher used the ADRL model with bound testing co-integration to capture the determinants of coffee and to explore the long-run relationship as well as the short-run relationship of total volume coffee exports in Ethiopia with its determinants captured, i.e., domestic coffee production, world coffee price, real exchange rate, FDI inflows, world coffee production, and the price ratio. The approach used by the study confirmed the existence of a long-term relationship between total coffee exports in Ethiopia and the independent variables, and the analysis of the model showed that in the long run, domestic coffee production, the world price of coffee, and the exchange rate have a positive and significant effect on the total export. Those that have a negative and significant effect are FDI, price ratio, and world production of coffee, but in the short run, these are insignificant. The Granger causality test was used by the researcher to test the unidirectional, bidirectional, and independent. The researcher suggested to encourage the sector of coffee the policy setting, institutions, and market has to work together.

Assefa (2018) has examined the export competitiveness and determinants of export performance of the Ethiopian coffee sector by observing the periods from 1991 to 2016. To investigate the determinants of coffee export competitiveness, the researcher used multiple (OLS model) regression for analysis and revealed comparative advantage (RCA) and revealed symmetric comparative advantage (RSCA) to measure the competitiveness of Ethiopian coffee exports, which the result shows that Ethiopia has a comparative advantage in the export of coffee. As a result, the analysis of the model showed that the domestic consumption of coffee has a negative and significant effect on the competitiveness of coffee exports, while the rest variables has a positive effect on the competitiveness of coffee export in Ethiopia, the variables are domestic production level, world price of coffee, exchange rate, and export volume and the effect is significant, but the domestic price of coffee has a positive effect on the competitiveness of coffee exports, but the effect is statistically insignificant. So Assefa (2018) recommended that the fact the nature of coffee is volatile market both in the country and internationally, the supply side has to be addressed, the price risks have to be managed, promoting quality improvement, and avoiding illegal trade to maintain the comparative advantage and competitiveness of the country in the export of coffee for the international market.

Tadesse (2015) Tadesse (2015) used observation to look at the main factors influencing Ethiopia's supply of coffee for export from 1981 to 2011. To determine the key factors, the researcher used error correction and vector auto-regressive techniques. Additionally, the Granger causality test was employed in the study to demonstrate the direction of causality between the supply of coffee exported and a few of the independent variables. The study's conclusions showed that the actual export price of coffee, domestic coffee output, physical infrastructure, and global coffee supply all had significant effects on the amount of coffee exported. Only over an extended period of time does the GDP ratio, which measures trade openness by summing up exports and imports, impact the supply of coffee exported. The analysis of the model showed that real exchange rate is statistically insignificant both in the short and long-run relationship. As a result, the researcher suggested the quality of the coffee exported have to be improved, production of coffee in the country have to be encouraged and increase, and the infrastructure of the road have also a significant impact for the supply of coffee which needs to be improved.

Kiprono and Mutai (2019) have investigated the determinants of coffee exports in Kenya. The researchers identified the independent variables, which are world real gross domestic product, trade openness, institutional quality, export capacity, domestic production of coffee, inflow of FDI, and real exchange rate. The error correction model (ECM) was employed to analyze the presence of co-integration among the variables in the study, which was done based on the observation of the period from 1980 to 2018. For the validity of the ECM result, pre- and post-diagnostic tests were made by the researchers. To verify the fitness and reliability of the model, post-diagnostic tests, which include heteroscedasticity and autocorrelation, were used. Among the variables, domestic production of coffee, institutional quality, and the real exchange rate have a positive effect on the export of coffee in Kenya, both in the long and short run. On the other hand, the world's real gross domestic product has a negative effect on the export of coffee. As a result, the researchers recommended the adoption of government policies that promote institutional management, reduction of corruption, and respect for the law. They also implied that the government should support the coffee farmers by providing subsidies, agricultural extension services, and research and development for the enhancement of coffee production. They summarized in this way that Kenya can improve the competitiveness of coffee exports.

Eshetu and Goshu (2021) examined the determinants of Ethiopian coffee in 31 trade partner countries by using the dynamic gravity model through the observation of the period 1998–2016 and the generalized moment method of estimation (GMM). The study showed Ethiopia was exporting only 39% of the total production, and of these, 53.5% were exported to European and 34.13% to Asian countries over the period. The researchers used regression to show that trade openness, population size of Ethiopia, FDI, and institutional quality index of Ethiopia have a positive and significant effect on the volume of coffee exported from Ethiopia. On the other hand, the population of the partner countries, weighted distance, lagged export volume, and real exchange rate affect the volume of coffee exports from Ethiopia negatively, and the effect is significant. Further, the researcher implies that the country needs to diversify and expand its export destinations, as well as export items, from primary agricultural exports to secondary industrial exports, in order to secure a sustainable source of foreign exchange. In addition, controlling corruption, increasing government effectiveness, ensuring political stability, promoting foreign direct investment, and encouraging trade liberalization would also help boost the volume of Ethiopian coffee exports.

2.7 Conceptual framework and hypothesis

2.7.1 Conceptual framework

Based on the literature reviewed above and empirical studies, the researcher has conducted the model below that explains that coffee export competitiveness is affected by the domestic production of coffee, the world price of coffee, the world production of coffee, the real exchange rate, FDI inflows, and the total coffee exports of the country, which are the independent variables for the study. Where the export competitiveness is the dependent variable that is affected by the listed determinants.

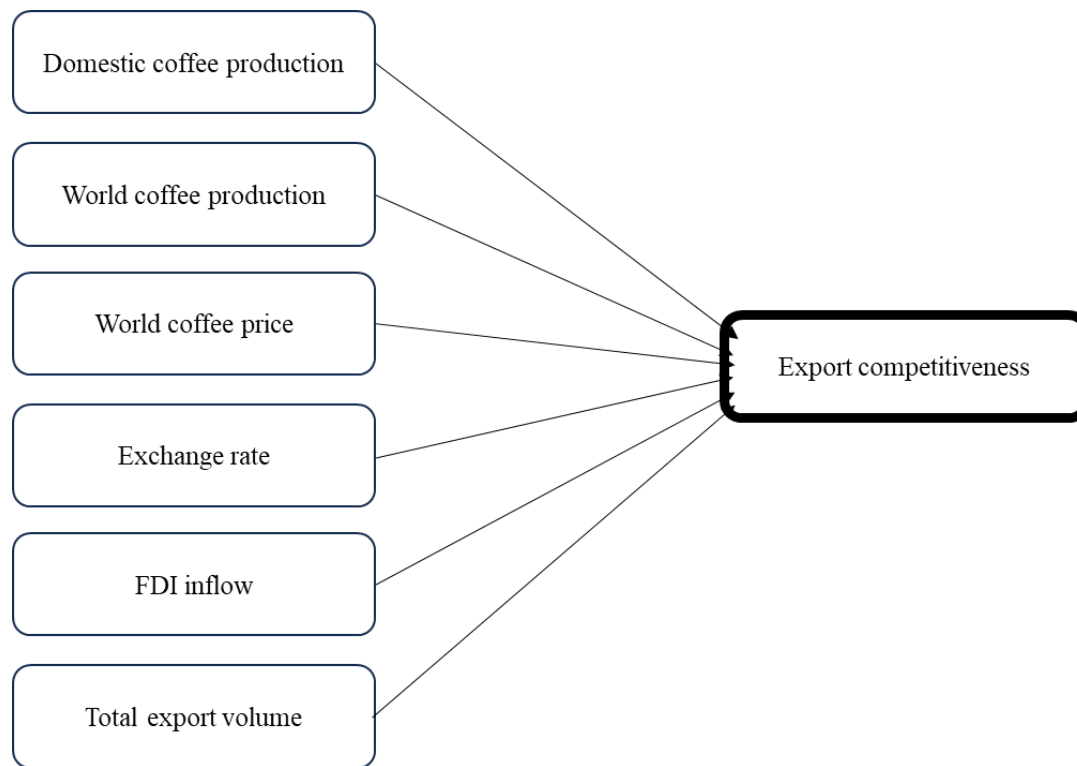


Figure 1 conceptual framework

Source: Adapted from David and Christian (2013) and Assefa (2018)

Domestic coffee production is the total amount of coffee produced, measured in tons, in Ethiopia in the given crop year. This variable is independent; it explains how the produced amount affects the competitiveness of Ethiopia in exporting coffee. The data for domestic coffee production will be obtained from FAOSTAT and UN-COMTRADE.

Exchange rate: the data for the exchange rate will be obtained from NBE; it is an independent variable in which it explains whether the exchange rate, i.e., from Ethiopian birr to US dollar, through the given range has an effect on the competitiveness of Ethiopia in exporting coffee to the international market.

Export volume is the total amount of coffee Ethiopia has exported to the world. Which, as an independent variable, explains how the amount of coffee exported to the world affects the competitiveness of Ethiopia. The data will be obtained from the ITC (International Trade Center).

World coffee price: the annual base price of worldwide coffee will be obtained from the ICO (International Coffee Organization), and the world coffee price is an independent variable that explains how the price of coffee on the international market affects the Ethiopia's competitiveness in the exporting of coffee.

World coffee production is the total amount of coffee produced world-wide by the top ten coffee producers and exporting countries except for Ethiopia, i.e., Brazil, Vietnam, Colombia, Honduras, Indonesia, Uganda, India, Mexico, and Guatemala, measured in tons. The data will be obtained from FAOSTAT and UN-COMTRADE. World coffee production is an independent variable, which explains how the total sum affects the export competitiveness of Ethiopia in exporting coffee.

Foreign direct investment is the total amount of stock of foreign direct investment (FDI) in US dollars (millions), which is an independent variable that explains how the amount of FDI inflow to the country affects the international competitiveness of Ethiopia on the export of coffee. The data will be obtained from the ITC (International Trade Center) and UNCTAD.

Export competitiveness: when a country has a higher competitiveness index in the export of selected commodity, it helps in sustaining and maintaining the economic in collapse and benefit in the development of the national economy. (Bruneckiene and Paltanaviciene, 2012).

2.7.2 Hypothesis

The researcher has given the following key factors as a hypothesis to test their effect and significance in affecting the competitiveness of the coffee export in Ethiopia.

As in the study (Kiprono and Mutai, 2019) researched on the factors that influence the coffee exports in Kenya, the researcher found that the domestic production level of coffee in the country has a significant effect on competitiveness, and the effect is also positive.

H1: The domestic production level of coffee has a significant impact on the competitiveness of coffee export in Ethiopia.

Diriba (2021) studied the determinants of coffee export and the competitiveness of Ethiopia. The researcher concluded the study with the effect that the total amount of coffee produced in the world is significant to the competitiveness of Ethiopia and affects it negatively in the long run, but it is insignificant in the short run.

H2: World coffee production has a significant effect on the competitiveness of coffee export in Ethiopia.

Tadesse (2015) studied the major determinants of coffee export in Ethiopia, and the researcher concluded that the price of coffee in the world has significant and positive effects on competitiveness. As a result, when the price of coffee in the world rises, exporters will be encouraged to export more.

H3: The world price of coffee has a significant effect on the export competitiveness of coffee in Ethiopia.

In their study, (Eshetu and Goshu, 2021) studied on the determinants of Ethiopian coffee exports to 31 trade partners worldwide. Their analysis result shows that the exchange rate has a significant and also negative effect on the volume of coffee exports to the 31 trade partners over the observed time period.

H4: The exchange rate has a significant effect on the export competitiveness of coffee in Ethiopia.

Gönül & Yusuf (2016) conducted empirical research on the determinants of export competitiveness in the manufacturing sector for the OECD countries, which the result on the analysis suggested as a conclusion to their study that the inflow of foreign direct investment to a country has a negative impact on the country's export competitiveness.

H5: The foreign direct investment in flow has a significant effect on the competitiveness of coffee export in Ethiopia.

Assefa (2018) has conducted a study on the export competitiveness and the export performance of the Ethiopian coffee sector. Based on the regression the researcher has done on the given range of time, it shows that the total volume of coffee exported has a positive and significant effect on the competitiveness of Ethiopia in the coffee sector. As a result, as the volume of exported coffee increases, so does the competitiveness of Ethiopia in the world in the coffee sector.

H6: The total exported coffee from Ethiopia has a significant effect on the competitiveness of coffee export in Ethiopia.

Chapter three

3 Research methodology and design

3.1 Introduction

This chapter will discuss the study area, the research design, and the methodological approaches that the researcher used to address the study objectives. This includes the sampling procedure, data type, data sources and collection methods, data analysis and interpretation methods, and the ethical considerations taken into account while conducting the research.

3.2 Research approach

Creswell (2009) has identified the three main approaches to research, i.e., quantitative, qualitative, and mixed approaches. Qualitative approach is used to explore and have deep understanding of the nature of the problem and interpretation. Quantitative approach is used in order to determine the magnitude of the variation and quantify the variation of a problem, the information is also collected with quantitative variables. The mixed research approach involves using both qualitative and quantitative data collection method, which involves two types of data with different design and theoretical frameworks. This approach enables a better understanding of the research problem.

To have a better understanding and analysis, the study will use a quantitative approach, in which the quantitative approach will be used for the econometrics model, which will be gathered from the secondary data from different sources with valid data.

3.3 Research design

This study analyzed a time series of records to identify the determinants. Time series design is a subcategory of longitudinal research design, which is research design that emphasize on observation of variables on a long period of time. The study used explanatory research design in which it explains what affects the export competitiveness and understanding the factors and the relation between the dependent and independent variable. The research design has a quantitative data to give the most relevant information. Those determinants that affect the export competitiveness of coffee is assessed using a quantitative approach, in which it is collected from different sources according to the available data in the period of the research.

3.4 Target Population and sampling

This study used data from International Coffee Organization (ICO) for sourcing the world price of coffee, the United Nations Food and Agriculture Organization Statistics (UN-FAOSTAT) for sourcing the domestic and world production of coffee, the United Nations Statistics Division of Commodity Trade (COMTRADE) again for sourcing the domestic and world production of coffee, United Nations Conference on Trade and Development (UNCTAD) to source the stock of foreign direct investment in the country, International Trade Center (ITC) to source the total export volume of coffee. The data covers the time period from 1993 to 2022.

In this study, the non-probability sampling method is used, as is the purposive sampling technique, which does not signify the entire population but is used because the populations are intentionally selected based on the data it consists and has the most relevant data.

3.5 Data collection method

The study used secondary sources of relevant data by using different data collection instruments to obtain the objective of the study. Among the various secondary data collection methods, desk review is used and sending an email for membership for some data sources to access the relevant data.

The quantitative data will be gathered from a secondary data of the International Coffee Organization, World Bank, International Monetary Fund, National Bank of Ethiopia, Ethiopian Commodity Exchange, Ethiopia Coffee and Tea Authority, Ministry of Trade, central statistical agency, United Nations Food and Agriculture Organization statistics, and United Nations statistical division of commodity trade.

3.6 Method of Data analysis

The basic data used for this study is secondary data collected from the International Coffee Organization, World Bank, International Monetary Fund, National Bank of Ethiopia, Ethiopian Commodity Exchange, Ethiopia Coffee and Tea Authority, Ministry of Trade, central statistical agency, United Nations Food and Agriculture Organization statistics, and United Nations statistical division of commodity trade.

3.7 Model specification

To measure the export competitiveness, the researcher used the RCA and RSCA proposed by Bela Balassa with its index known as Balassa index. Balassa (1979, 1986) have summarized the RCA index that identifies the countries specialization and strong sector with the export share in the world. The competitiveness measured by the RCA is denoted by the comparative advantage, and is the countries product is denoted as competitive on the selected item, which suggest that the country has the Revealed comparative advantage.

3.7.1 Revealed comparative advantage (RCA)

Liesner (1958) suggested that by analyzing the actual export flows, it can determine the countries strong sector. Which further popularized by Bela Balassa with the Balassa index. Revealed Comparative Advantage of a specific country represents the country's international share on the selected item or industry in the international market in reference to the world's share of trade in that specific item or industry. In general, if BIX_a is country X's Balassa index is normalized export share for industry a, defined as to:

$$BIX_a = \frac{\text{share industry in the country X export}}{\text{share industry A in reference country export}}$$

If $BIX_a > 1$, country X is said to have a revealed comparative advantage in industry A, when this industry or item is more important for country X's exports than for the exports of the reference countries in the world.

In the case of Ethiopia for the coffee export, RCA is defined as follows depending on the Balassa index above:

$$RCA_t = \frac{(\text{coffee export of Ethiopia (t)} / \text{agricultural export of Ethiopia (t)})}{(\text{world coffee export (t)} / \text{world agricultural export (t)})}$$

Where: 't' is time in a given year

The value of RCA index will be more than one. If it takes a value less than or equal to 1, that country may not have a comparative advantage on the selected industry or item to export it to the international market. (ITC, 2016). Hinloopen (2001) mentioned in Birol & Kasim (2014) Purposed further divide revealed comparative advantage into four as follows:

Where the value is $0 < RCA \leq 1$ then, there is no comparative advantage.

Where the value is $1 < RCA \leq 2$ then, there is a weak comparative advantage.

Where the value is $2 < RCA \leq 4$ then, there is moderate comparative advantage.

Where the value is $4 > RCA$ then, there is a strong comparative advantage

3.7.2 Revealed symmetric comparative advantage (RSCA)

The Revealed Symmetric Comparative Advantage measure reflects the RCA in its symmetric form as an index of competitiveness.

$$RSCA = \frac{RCA - 1}{RCA + 1}$$

Where the value of RSCA ranges from (-1 to +1). The closer the value is to +1, the higher the competitiveness of a country in the selected commodity of interest.

3.7.3 ARDL model

The time series model's autoregressive feature shows that each variable's current value is based on its historical value as well as a few adjusting factors. These adjustment factors are calculated using the relationship between the current and previous values. (Shrestha and Bhatta, 2018). On this model the effect of each independent variables with their magnitude and coefficient will be identified with the time series data that ranges from 1993-2022 and in addition identify their short run and long run effect on the dependent variable. On this study, the variable used as a dependent is export competitiveness which is indexed by the RSCA and will be explained by the independent variables which includes domestic production of coffee, the exchange rate, the total volume of export, world coffee price, world production of coffee, and FDI inflows.

$$RSCA_t = F [DProt, REER_t, TEX_{vt}, WProt, WPrit, FDI_t]$$

Where, $RSCA_t$ = Revealed Symmetric Comparative Advantage at time t

$DProt$ = Domestic Production of Coffee (tons) at time t

$REER_t$ = Real effective Exchange Rate of Birr in terms of USD at time t

TEX_{vt} = Export volume of coffee at time t

$WPrit$ = World Price Coffee at time t

$WProt$ = world production of coffee at time t

FDIt=stock foreign direct investment inflows at time t.

The above equation can be represented in a multiple linear regression model, according to (David, Christian, 2013) on the natural logarithmic model for this study can be stated as;

$$\text{LnRSCAt} = \beta_0 + \beta_1 \text{LnDProt} + \beta_2 \text{LnREERt} + \beta_3 \text{LnTExVt} + \beta_4 \text{LnWPrit} + \beta_5 \text{LnWProt} + \beta_6 \text{LnFDIt} + \varepsilon_t$$

Where, β_0 = intercept term β_i = coefficient/elasticities ε_t = error term. Both the dependent and independent explanatory variables are expressed in a natural logarithmic form, the elasticities are denoted by the coefficients β_1 – β_6 .

Chapter four

4. Results, Analysis and Discussion

4.1 Introduction

In this chapter, the findings of the study based on the empirical analysis of the collected data are presented, along with a discussion of the results. To determine the variables influencing the competitiveness of coffee export in Ethiopia, the competitiveness of Ethiopia on the export of coffee will be evaluated, and then the effect of each independent variable will be analyzed. The study will further evaluate the significance of the effect in the short run and the long run relationship.

4.2 Empirical Analysis

4.2.1 Statistical analysis

In this section, the descriptive statistical analysis is carried out before continuing to the econometric part of the analysis. This section shows how competitive Ethiopia is at exporting coffee to the world within the given range of years. The table below will give a general insight into the Ethiopian situation in coffee exporting.

As shown in the table below, the average production of coffee domestically is 312,601.25 tons, with a maximum production of 584,789.57 tons and a minimum production of 126,188 tons in the year range of 1993-2022. Likewise, on average, the total amount of exported coffee is 164,543.28 tons, with the maximum exported amount of 303,551 tons and the minimum amount of exported coffee from Ethiopia being 70,005 tons. This gives an insight into the fact into the fact that almost half of the coffee produced in Ethiopia is exported to the worldwide market.

In addition, over the observed time, the average value of the RCA is 5.349, with a maximum value of 9.55 and a minimum value of 3.52, which shows Ethiopia has a comparative advantage over time. As per the classification by Birol and Kasim (2014) Ethiopia has observed a strong comparative advantage with the maximum value and a moderate comparative advantage with the minimum value, both of which indicate that Ethiopia has a comparative advantage over coffee. Likewise, the average value of RSCA is 0.667, with a maximum value of 0.81 and a minimum value of 0.557, which shows that the values are close to 1. Ethiopia holds high competitiveness in coffee as a commodity over the period 1993–2022.

Table 1 statistical summary of observation from 1993-2022

variables	Domestic production of coffee	World production of coffee	World price of coffee	Exchange rate	FDI inflow	Total coffee export	RCA	RSCA
mean	312601.25 13	5822853.0 78	115.37571 43	14.611755 01	1065.2691 87	164543.28 53	5.3498421 23	0.6726027 76
median	262854	5940275.2 8	113.515	8.6986158 33	288.27199 99	159423.41	4.7690526 15	0.6532099 62
minimum	126188	3457067	44.84	2.07	0.17	70005	3.5202447 5	0.5575460 82
maximum	584789.57	8509185.0 4	205.65	51.756215 03	4259.4452 11	303679.24	9.5501553 74	0.8104293 32
standard deviation	134565.26 84	1504906.9 24	41.678953 78	11.854405 19	1421.2689 55	62346.324 86	1.4015089 39	0.0608842 64
Co variance	0.430469	0.258448	0.361245	0.811292	1.334187	0.378905	0.261972	0.090520
skewness	0.50275	-0.01179	0.31145	1.58832	1.27797	0.41602	1.48682	0.44283
observati on	30	30	30	30	30	30	30	30

Source: own computation and calculation

4.3 Revealed comparative advantage

The revealed comparative advantage is an index in which it is used to indicate the relative advantage and/or disadvantage of a particular country in a selected product or service by which that country will be selling out to the international market.

To evaluate the comparative advantage Ethiopia has on coffee, this study has conducted a RCA index analysis for the top ten (10) coffee-producing and exporting countries to the worldwide market, which can assess the degree of advantage or disadvantage that the country has in the international market. The classifications on the RCA index are if a country has a value of RCA greater than one (1) it indicates that country has the comparative advantage on the product or service selected, for further classification (if $1 < RCA < 2$: there is weak comparative advantage, $2 < RCA < 4$: moderate comparative advantage, $RCA > 4$: strong comparative advantage) and if the

RCA index value is less than one (1), that country has a comparative disadvantage on the selected product or service in the international market.

Table 2 RCA of top ten coffee producing and exporting countries

year/co untry	RCA Ethioipa	RCA Brazil	RCA Vietnam	RCA Colombi a	RCA Honduru s	RCA Indonesi a	RCA Uganda	RCA India	RCA Mexico	RCA Guatamel a
1993	6.698	0.737	0.933	4.327	1.898	0.677	4.441	0.168	0.499	1.904
1994	3.979	0.788	1.213	3.223	2.150	0.744	4.004	0.206	0.414	1.598
1995	3.505	0.697	1.867	3.098	3.288	0.702	4.244	0.193	0.589	2.202
1996	4.911	0.680	1.275	3.458	2.325	0.785	4.591	0.175	0.702	2.346
1997	3.568	0.919	1.192	3.639	0.035	0.521	3.444	0.181	0.694	2.257
1998	4.074	0.873	1.415	3.259	0.214	0.757	3.427	0.209	0.493	2.113
1999	3.802	1.002	1.467	2.813	2.914	0.535	3.077	0.191	0.483	2.412
2000	4.267	0.846	1.622	2.895	3.840	0.449	3.450	0.146	0.588	2.884
2001	4.665	0.7250	1.8859	3.6464	4.6177	0.5168	2.0788	0.2964	0.3026	2.7974
2002	5.791	0.7791	1.7033	4.1129	4.4801	0.4721	4.5791	0.2840	0.2519	2.717
2003	5.329	0.6673	2.6187	4.2628	4.3628	0.5385	1.4696	0.3125	0.2233	3.1077
2004	7.342	0.6773	2.5742	4.1125	4.8790	0.4507	4.2378	0.2368	0.2184	3.1531
2005	4.324	0.7252	1.8687	4.1389	4.5386	0.5740	4.0617	0.2760	0.1770	2.6719
2006	5.497	0.7146	2.7423	3.6014	4.7338	0.5525	4.0986	0.2662	0.2079	2.9242
2007	4.4731	0.7082	3.6234	3.6685	4.9477	0.4116	3.9049	0.1871	0.2049	2.3972
2008	4.8730	0.7286	3.1050	3.8083	4.9824	0.4722	4.9307	0.2010	0.1910	2.5518
2009	3.5202	0.7513	2.7492	3.6624	5.0928	0.5096	4.2903	0.1937	0.2216	2.2301
2010	4.6573	0.9194	2.2689	4.4228	5.5930	0.3625	3.7711	0.1914	0.1794	2.3430
2011	4.0712	0.9803	2.1581	4.2353	6.2414	0.3101	3.9813	0.1932	0.2425	2.6192
2012	4.6387	0.7441	3.1108	3.8492	7.4357	0.4573	3.866	0.1572	0.3293	2.5494
2013	4.4449	0.7329	2.9600	5.0232	6.3741	0.6014	5.1872	0.1728	0.2467	2.4648
2014	4.0533	0.9034	2.7413	5.0254	5.2245	0.3835	4.4068	0.1554	0.1571	1.8088
2015	4.4945	0.9188	1.8428	5.4518	5.7961	0.4819	4.0286	0.2010	0.1428	1.7840
2016	4.3668	0.8331	2.3601	5.4382	5.6816	0.4234	4.1749	0.2309	0.0937	1.7893
2017	5.6341	0.6973	2.2094	5.5169	6.3928	0.4417	4.8377	0.2472	0.1337	1.9611
2018	5.9668	0.7260	2.4259	5.7586	7.9528	0.3660	4.2348	0.2213	0.1257	2.069
2019	6.0692	0.8342	1.8257	5.8507	8.0544	0.4389	4.9460	0.2276	0.0814	1.9363
2020	6.4641	0.9356	1.6544	6.2711	6.2406	0.3712	5.7229	0.2036	0.1012	1.8744
2021	7.4758	0.8814	1.5693	6.4988	9.1217	0.2581	6.3347	0.2071	0.1005	2.4658
2022	9.5501	1.0043	0.0093	6.8696	7.0035	0.3246	6.3328	0.2318	0.1676	2.5089
average	5.083	0.804	2.033	4.398	4.880	0.496	4.205	0.212	0.285	2.348

Source: own computation and calculation from ITC

The above table shows the comparison of countries based on the RCA index they have on exporting coffee for a period of 1993–2022. The data is extracted and calculated from the International Trade Center (ITC) database. As per the observation from the table, Ethiopia, Colombia, Honduras, and Uganda have a strong comparative advantage on coffee; Vietnam and Guatemala have a moderate comparative advantage on coffee; and Brazil, Indonesia, India, and Mexico have a weak comparative advantage on coffee. This means those countries with a weak comparative advantage on coffee are exporting other agricultural products in far greater volume than coffee.

Ethiopia has a 5.29 RCA index value on coffee, which means that this country has a strong comparative advantage. In general, the sector has a significant international comparative advantage in terms of capacity to produce, the availability of the raw material, lower labor costs, and the availability of coffee to export. As discussed in the previous section, Ethiopia is the birthplace of coffee Arabica and consists of different varieties, so an index of revealed comparative advantage is expected. But also, various reasons and factors can affect the index.

With this comparative advantage Ethiopia has in the coffee sector, it has the potential to gain more market share on the international market and supply more to the international market by potentially producing and assessing the factors that can affect the export of coffee and its ability to sustain itself in the international market.

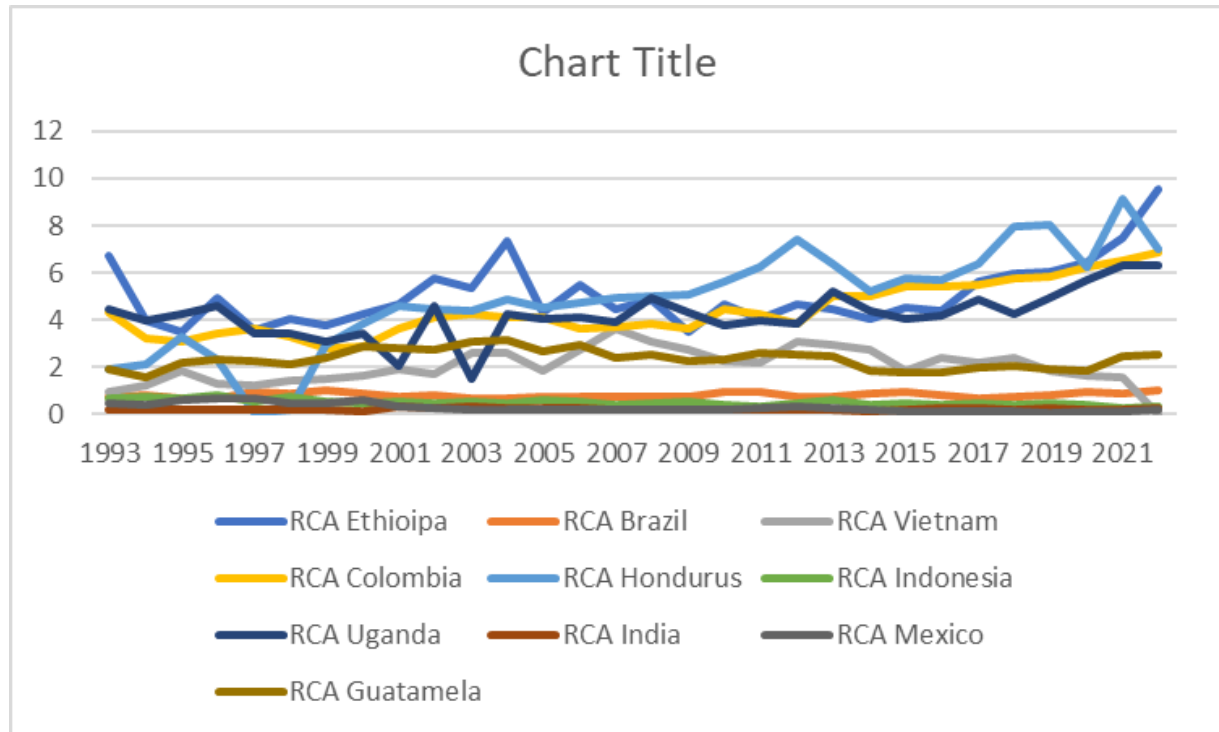


Figure 2 RCA of top ten coffee exporting countries from 1993-2022

4.4 Revealed Symmetric Comparative Advantage

To analyze the export competitiveness of a country, the Revealed Symmetric Comparative Advantage (RSCA) index will be calculated and evaluated. Likewise, this study has carried out the RSCA analysis to investigate the export competitiveness of coffee for the top ten producers and exporters of coffee in the period 1993–2022. The RSCA ranges from -1 to +1; the closer the index value is to +1, the higher the competitiveness of the country in the commodity of interest, and the closer the index value is to -1, the lower the competitiveness of the country in the commodity of interest.

Table 3 RSCA of top ten coffee producing and exporting countries

year/country	RSCA Ethiopia	RSCA Brazil	RSCA Vietnam	RSCA Colombia	RSCA Honduras	RSCA Indonesia	RSCA Uganda	RSCA India	RSCA Mexico	RSCA Guatemala
1993	0.740	-0.151	-0.034	0.624	0.309	-0.192	0.632	-0.711	-0.333	0.311
1994	0.598	-0.118	0.096	0.526	0.365	-0.146	0.600	-0.657	-0.414	0.230
1995	0.556	-0.178	0.302	0.512	0.533	-0.174	0.618	-0.675	-0.258	0.375
1996	0.661	-0.190	0.121	0.551	0.398	-0.120	0.642	-0.701	-0.174	0.402
1997	0.562	-0.042	0.087	0.568	-0.935	-0.314	0.549	-0.692	-0.180	0.386
1998	0.605	-0.067	0.171	0.530	-0.646	-0.137	0.548	-0.653	-0.339	0.357
1999	0.583	0.0013	0.189	0.475	0.489	-0.302	0.509	-0.679	-0.347	0.413
2000	0.620	-0.083	0.237	0.486	0.586	-0.380	0.550	-0.744	-0.259	0.485
2001	0.6469	-0.1594	0.3069	0.5695	0.6439	-0.3185	0.3504	-0.5426	-0.5353	0.4733
2002	0.7054	-0.1241	0.2601	0.6088	0.6350	-0.3585	0.6415	-0.5575	-0.5975	0.4620
2003	0.6840	-0.1995	0.447	0.6199	0.6270	-0.2999	0.1901	-0.5237	-0.6348	0.5131
2004	0.7602	-0.1923	0.4404	0.6088	0.6598	-0.3786	0.6181	-0.6170	-0.6414	0.5184
2005	0.6243	-0.159	0.3028	0.6108	0.6389	-0.2705	0.6048	-0.5673	-0.6991	0.4553
2006	0.6918	-0.1664	0.4655	0.5653	0.6511	-0.2881	0.6077	-0.5794	-0.6557	0.4903
2007	0.634	-0.170	0.567	0.571	0.663	-0.416	0.592	-0.684	-0.659	0.411
2008	0.659	-0.156	0.512	0.584	0.665	-0.358	0.662	-0.665	-0.679	0.436
2009	0.557	-0.141	0.466	0.571	0.671	-0.324	0.621	-0.675	-0.637	0.380
2010	0.646	-0.041	0.388	0.631	0.696	-0.467	0.580	-0.678	-0.695	0.401
2011	0.605	-0.009	0.366	0.617	0.723	-0.526	0.598	-0.676	-0.609	0.447
2012	0.645	-0.146	0.513	0.587	0.762	-0.372	0.588	-0.728	-0.504	0.436
2013	0.632	-0.154	0.494	0.667	0.728	-0.248	0.676	-0.705	-0.604	0.422
2014	0.604	-0.050	0.465	0.668	0.678	-0.445	0.630	-0.730	-0.728	0.287
2015	0.636	-0.042	0.296	0.690	0.705	-0.349	0.602	-0.665	-0.749	0.281
2016	0.627	-0.091	0.404	0.689	0.700	-0.404	0.613	-0.624	-0.828	0.282
2017	0.698	-0.178	0.376	0.693	0.729	-0.387	0.657	-0.603	-0.764	0.324
2018	0.712	-0.158	0.416	0.704	0.776	-0.464	0.617	-0.637	-0.776	0.348
2019	0.717	-0.090	0.292	0.708	0.779	-0.389	0.663	-0.629	-0.849	0.318
2020	0.732	0.033	0.246	0.724	0.723	-0.458	0.702	-0.661	-0.816	0.304
2021	0.764	-0.063	0.221	0.733	0.802	-0.589	0.727	-0.656	-0.817	0.422
2022	0.810	0.002	-0.981	0.745	0.750	-0.509	0.727	-0.623	-0.712	0.430
avege	0.6575	-0.1119	0.2814	0.6149	0.5507	-0.3465	0.5976	-0.6516	-0.5834	0.3938

Source: own computation and calculation from ITC

The table above shows the revealed symmetric comparative advantage of the top ten coffee producing and exporting countries, in which their RSCA index shows their competitiveness on the international market as it gets closer to one (+1). Likewise, Ethiopia, Colombia, Honduras, and Uganda have higher competitiveness as their RSCA index is closer to one (+1), Vietnam and

Guatemala have a positive RSCA index, which also represents that they have competitiveness in the international market, while Brazil, Indonesia, India, and Mexico have a negative value for their RSCA index.

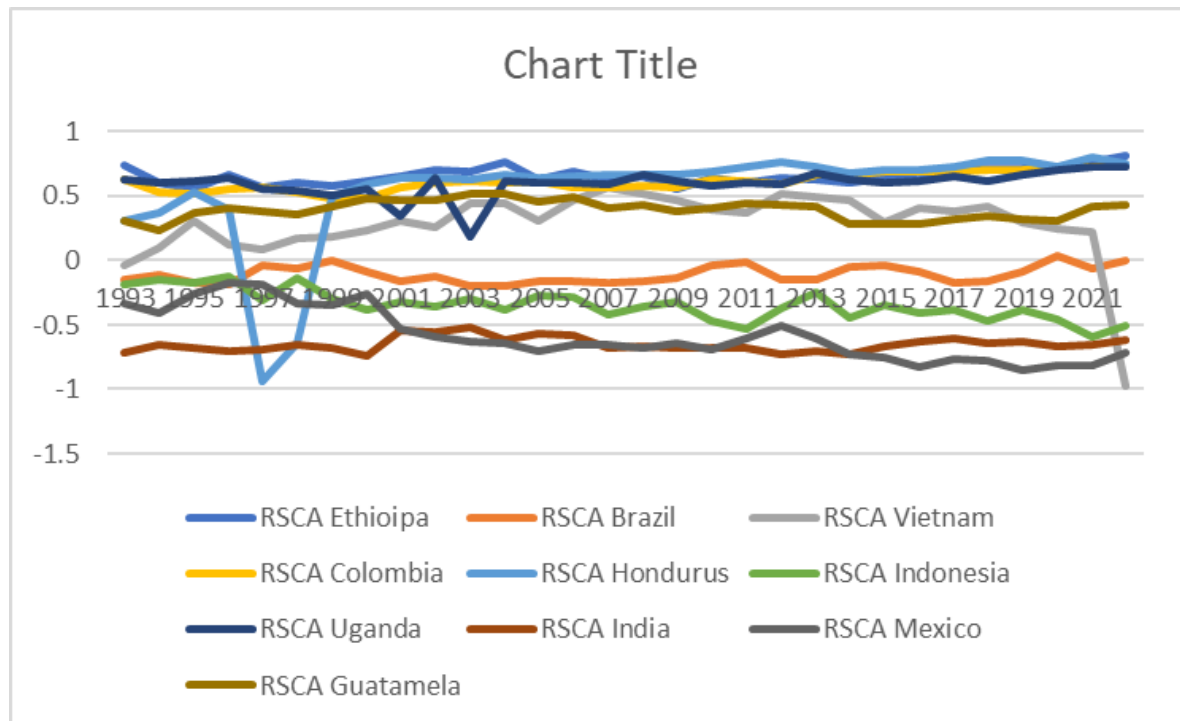


Figure 3 RSCA of top ten coffee exporting countries from 1993-2022

Generally, the results of both the revealed comparative advantage and the revealed symmetric comparative advantage of Ethiopia show that there is a significant value for the coffee sector in that it holds comparative advantage and competitiveness in exporting coffee to the international market.

4.5 Descriptive analysis

On this study there are seven explanatory variables used in the analysis, which of the six are independent variables and one dependent variables. The descriptive statistical summary for the determinants of coffee export competitiveness is the Domestic production of coffee, World production of coffee, world price of coffee, FDI inflows, Exchange rates, and the Total exported volume of coffee. To analyze the variables STATA software is used on the observation of annual bases for 30 years from 1993-2022.

As the table of statistical summary shows, the means of all variables are positive, which shows that the variables are all on increasing average. The standard deviation of all variables is also

positive, which shows the existence of variation in the values of the variables. And the minimum and maximum values also have a positive value in which shows there is no negative value in the variable and all variables are positive in value respectively.

4.6 Test of stationary

A time series data is stationary time series when the statistical properties, such as mean, variance, covariance, remain constant over time. In other words, time series data is stationary at various lags, so the statistical properties are independent at which they are observed and remains constant at every point we measure them. The variance, covariance, and mean of this time series should not be impacted by the various points during the time interval. Instead, the variance will tend to be constant as the time series reverts to its mean and fluctuates about it. However, the mean and variance of the time series will be impacted by temporal variance and the statistical features might not be constant if the time series exhibits weak or non-stationarity. A spurious regression result will arise from the analysis of a regression based on non-stationary time series; this type of spurious regression result is known as a random walk. The non-stationary time series' regression yields a relationship between the variables that is not fully meaningful. The presence of non-stationarity can be changed to stationarity through differencing variable again. If the original time series is differenced once, we call it Integrated of order one or $I(1)$ and if it is differenced twice it become integrated of order two or $I(2)$ (Gujarati, 2004).

To test the time series data its stationarity, this study used the Phillip-perron (PP) after (Phillips and Perron, 1988) test. The result of fitting from the Phillips–Perron test used to calculate the test statistics. Phillips and Perron (1988) proposed two alternative statistics, which pperron presents. Phillips and Perron's test statistics builds on Dickey–Fuller statistics that have been made robust to serial correlation by using the Newey–West (1987) heteroskedasticity- and autocorrelation-consistent covariance matrix estimator. pperron uses Newey–West (1987) standard errors to account for serial correlation. pperron performs the Phillips–Perron (1988) test that a variable has a unit root. The null hypothesis is that the variable contains a unit root or is integrated of order 1, and the alternative is that the variable was generated by a stationary process

Null hypothesis (H_0): variables contain a unit root (non-stationary)

Alternative hypothesis (H_1): the variable was generated by stationary process

The decision is given based on the failure to reject the null hypothesis of no random walk when all variables are stationary of the order level or we fail to reject the null hypothesis which leads to test for stationarity. If the p-value from the test is above a critical threshold, we fail to reject the null hypothesis, suggesting that the series has a unit root.

Table 4: stationarity test

`variables`	At level`	1st d/c	Integration	Decision
lnDpro	0.7143	0.0000	I (1)	Stationary
lnWpro	0.5782	0.0000	I (1)	Stationary
lnWpri	0.6038	0.0013	I (1)	Stationary
lnFDI	0.1102	0.0000	I (1)	Stationary
lnREER	0.5165	0.0247	I (1)	Stationary
lnTExV	0.4331	0.0000	I (1)	Stationary
lnRSCA	0.4033	0.0000	I (1)	Stationary

Source: own survey result, 2024

From the above table we can see all variables are stationary at first difference. The unit root test reveals that the variables TExV, DPro, Wpro, Wpri, FDI, and REER are all independent variable, as they are integrated order one (1). Therefore, ARDL model with johanson test for co-integration is a better option than other models to provide the relationship between the export competitiveness and the independent variables.

The variable LnTExv have a p-value of 0.4331 at level which is greater that the significant level 0.05, so we reject the null hypothesis and run the difference once more. So at first difference the variable is stationary with p-value 0.0000.

The variable lnDPro is the natural logarithm for the domestic production of coffee which have a p-value of 0.7143 at level which is greater that the significant level 0.05, so we reject the null hypothesis and run the difference once more. So at first difference the variable is stationary with p-value 0.0000.

LnWPro is the natural logarithm for the variable world production of coffee, which have a p-value of 0.5782 at level which is greater that the significant level 0.05, so we reject the null

hypothesis and run the difference once more. So, at first difference the variable is stationary with p-value 0.0000.

The variable Ln WPri have a p-value of 0.6038 at level which is greater than the significant level 0.05, so we reject the null hypothesis and run the difference once more. So, at first difference the variable is stationary with p-value 0.0000.

LnREER is the natural logarithm for the variable real exchange rate which have a p-value of 0.5165 at level which is greater than the significant level 0.05, so we reject the null hypothesis and run the difference once more. So, at first difference the variable is stationary with p-value 0.0000.

The variable LnRSCA is the natural logarithm for revealed symmetric comparative advantage of Ethiopia on coffee, which the researcher used it as a dependent variable in the equation. The variable has a p-value of 0.4033 at level which is greater than the significant level 0.05, so we reject the null hypothesis and run the difference once more. So, at first difference the variable is stationary with p-value 0.0000.

4.7 Lag length determination and criterion selection

According to Pesaran et al. (2001) selecting criterion and lag length is the second step in performing the ARDL model. The fact the model used the previous history of the given data, which depends on the previous period, the lags have to be determined as well as the selection criterion. Thus, the ARDL model employs the optimum lag of dependent and explanatory independent variables using Akaike Information Criterion (AIC), Schwarz information criterion, and Hannan Quinn information criteria.

```
varsoc lnRSCA lnDpro lnWPro lnWpri lnFDI lnREER lnTEv
```

Selection-order criteria

Sample: 1997 - 2022

Number of obs

=

26

lag	LL	LR	df	p	FPE	AIC	HQIC	SBIC
0	53.5074				6.6e-11	-3.57749	-3.47996	-3.23878
1	136.355	165.69	49	0.000	5.6e-12	-6.18112	-5.40081	-3.47137
2	207.125	141.54	49	0.000	2.8e-12	-7.85574	-6.39266	-2.77496
3	1725.92	3037.6	49	0.000	1.9e-59*	-120.917	-118.771	-113.465
4	5560.76	7669.7*	49	0.000	.	-413.751*	-411.215*	-404.944*

Endogenous: lnRSCA lnDpro lnWPro lnWpri lnFDI lnREER lnTEv

Exogenous: _cons

Figure 4 criterion selection

To select the criterion, we select the criterion in which it has the more strikes (*) on the lag and with the least number in consideration of the sign. From the above selection order criteria, the AIC has the least value of -413.751. So, for this model the researcher will be using the AIC as criterion.

4.8 Johanson cointegration test

As mentioned in IMF working paper, (Hjalmarsson and Osterholm, 2007) Johansen's methodology is typically used in a setting where all variables in the system are I(1). If a single variable is I(0) instead of I(1), this will reveal itself through a cointegrating vector whose space is spanned by the only stationary variable in the model.

Rehal (2023) defines cointegration as the situation where the variables have a long-run or equilibrium relationship. Such variables move together over time and can be said to have a similar wavelength or share a common trend. It is suggested that for Johansen's approach to work, all variables must have the same order of integration. If any variable has a different order of integration, we cannot use the Johansen Test. (Johansen, 1991). The decision rule is if the trace statistics against the 0.05 significance level has a greater value, then we accept the null hypothesis.

Ho: no co-integration

H1: co-integration

4.10 ARDL estimate of long run model lags

Table: Long run result coefficient using the ARDL model, lags (2,2,2,1,0,0,0) ec

R²=0.8526 Adj R²=0.7158 N=28

Table 6: long run model result

Dependent variable: lnRSCA				
Repressors	Coefficient	Std.error	t-statistic	Prob, P> t
lnDPro	.3062	.1734	1.77	0.099
lnWPro	-.1124	.1878	-0.60	0.559
lnWPri	-.2303	.0828	-2.78	0.015
lnFDI	-.0009	.01878	-0.05	0.962
lnREER	-.2402	.1161	-2.07	0.058
lnTExV	.1897	.1062	1.79	0.096

Source: own computation from FAOSTAT, ITC, ICO, UNCTAD, UNCOMTRADE, and NBE (2022)

4.11 Discussion on the major findings of the model

The outcomes from the model analysis show that in the long run the variables lnDPro, lnWPri, lnREER, and lnTExV have statistically significant impact on the RSCA while on the short run lnDPro, lnWPro, lnWPri, and lnREER have significant impact on the competitiveness of Ethiopia. lnDPro has a positive and statistically significant (at 10% level of significance) factor on the RSCA. Other variables remaining constant, a unit increase in the domestic production of coffee increases the competitiveness of Ethiopia by 0.30 percent. In the short run lnDPro has a positive and significant effect at 5% level of significance level, which means other variables remaining constant the domestic production increasing in one unit will increase the RSCA with 0.199 percent. This result resembles the study of (Kiprono and Mutai, 2019) researched the factors influencing coffee exports in Kenya, the researcher found that the domestic production level of coffee in the country has a significant effect on competitiveness, and the effect is also positive.

In the long run the lnWPro has a negative but statistically insignificant effect on the RSCA at all level of significance. But in the short run world production has a negative and statistically

significant at 1% level of significance, which means other variables remaining constant a unit increase in the world production decreases the RSCA of Ethiopia by 0.35 percent in the short run. This result resembles with the study of Diriba (2021) which concluded the study with the effect that the total amount of coffee produced in the world is significant to the competitiveness of Ethiopia and affects it negatively in the long run, but it is insignificant in the short run. But on this study the significance is *Vise versa*.

Both in the long run and short run the $\ln WPr_i$ has a negative and statistically significant at all level on the competitiveness of Ethiopia. Which means in other word, other variables remaining constant a unit increase on the world price decreases the RSCA of Ethiopia by 0.23 and 0.27 percent in the long run and short run respectively. This result contradicts with the study of Tadesse (2015) on his study of the major determinants of coffee export in Ethiopia, and the researcher concluded that the price of coffee in the world has significant and positive effects on competitiveness.

The outcome of the model estimation shows that the $\ln FDI$ on both the short run and long run has negative effect on the competitiveness of Ethiopia on export of coffee but it is statistically insignificant. While the inflow of foreign direct investment is statistically insignificant on this study it resembles with the study of Gönül & Yusuf (2016) conducted empirical research to analyze the determinants of export competitiveness in the manufacturing sector for the OECD countries, which suggested as a conclusion to their study that the inflow of foreign direct investment to a country has a negative effect on the country's export competitiveness.

On this study the result of the model shows the $\ln REER$ on both the short run and long run has a negative and statistically significant effect on the competitiveness of Ethiopia on coffee with 5% and 10% significant level respectively. Other variables remaining constant the $\ln REER$ increasing in one unit will decrease the RSCA with 0.18% on the short run and 0.24% decrease on the long run. This result agrees on the study of (Eshetu and Goshu, 2021) examined the determinants of Ethiopian coffee exports to 31 trade partners worldwide. Their regression result shows that the exchange rate has a significant and also negative effect on the volume of coffee exports to the 31 trade partners over the observed time period.

The $\ln TExV$ has a positive and statistically significant (at 10% level of significance) factor on the RSCA on the long run. Other variables remaining constant, a unit increase in the total export

volume of coffee increases the competitiveness of Ethiopia by 0.19 percent. In the short run $\ln\text{TE}xV$ has a positive and insignificant effect at all level of significance. This study resembles the study of Assefa (2018) which conducted a study on the export competitiveness and the export performance of the Ethiopian coffee sector. Based on the regression the researcher has done on the given range of time, it shows that the total volume of coffee exported has a positive and significant effect on the competitiveness of Ethiopia in the coffee sector. As a result, as the volume of exported coffee increases, so does the competitiveness of Ethiopia in the world in the coffee sector.

4.12 Post estimation diagnostic test for the ARDL model

In order to depend on the result from the analysis of the model on the ARDL, the model has to be tested for its Multi Co-linearity test of correlation, heteroscedasticity test, normality test, autocorrelation test, Ramsey RESET.

4.12.1 Multi co-linearity test

As the definition of (Asterio and Hall, 2007) Multi collinearity is where there is a high correlation between the independent variables in the model and this shows that there is lack of independence between these variables in the given time series data. Even though the correlation among variables is perfectly correlated, there might be a presence of multi collinearity. This may mislead the outcome of the whole regression value.

Guajarati (2009) explains if the variance inflation factor (VIF) displays a high value the variables have more collinearity or problem and VIF more than 10 is inappropriate.

Table 7 multi co-linearity test result

variables	VIF	1/VIF
$\ln DPro$	8.16	0.1225
$\ln TE x V$	8.00	0.1250
$\ln FDI$	6.04	0.1654
$\ln WPro$	5.83	0.1714
$\ln REER$	3.85	0.2599
$\ln WPri$	2.62	0.3819
Mean VIF	5.75	

Source: own survey result, 2024

From the above table we can see the value of the mean VIF for this study is 5.75 which is less than 10, so there is no higher multicollinearity which shows that the explanatory variables are independent.

4.12.2 Serial Correlation

Asterio and Hall (2007) mentioned in their study that testing the correlation matrix among the explanatory variables presented in the model which is used to identify the presence of a significant multicollinearity problem among these explanatory variables that tie on the matrix, If the correlation coefficient between the explanatory variables which are aligned with each other on the matrix table is greater than 0.9, the variables are multicollinear.

Table 8 serial correlation test result

variables	lnRSCA	lnDPro	lnWPro	lnWPri	lnFDI	lnREER	lnTExV
lnRSCA	1.0000						
lnDPro	0.4702	1.0000					
lnWPro	0.6696	0.7706	1.0000				
lnWPri	0.1056	0.6688	0.3471	1.0000			
lnFDI	0.6268	0.7883	0.8619	0.2922	1.0000		
lnREER	0.3801	0.8323	0.7715	0.5185	0.7123	1.0000	
lnTExV	0.6828	0.8740	0.8698	0.5375	0.8507	0.8046	1.0000

Source: own survey result, 2024

4.12.3 Heteroscedasticity test

Gujarati (2004) defines Heteroskedasticity as one of the standard linear regression models which define the error term to get the homoscedasticity which is by having the same variance and the variance of error term for all observations in the time series. When the variance varies among the observations the model will have heteroscedasticity than homoscedasticity. As a result, the outcome will be miss-leading and wrong standard error will be observed. To overcome it, this test will be diagnosed on the model.

Table 9 heteroscedasticity test result

Breusch-pagan/ cook-weisberg test for heteroscedasticity	
H0: constant variance (homoscedasticity)	
Variables: fitted values of lnRSCA	
Chi2(1)	0.83
Prob>chi2	0.3629

Source: own survey result, 2024

The above table shows that $\text{prob} > \text{chi2} = 0.3629$ and $\text{chi2}(1) = 0.83$, the facts the value is greater than the 0.05 significance level which is 0.3629, we conclude that this model do not encounter non-constant variance.

4.12.4 Normality test

The statistical test we conduct to estimate the parameter and construct the confidence interval is the normality test. It is challenging to assess if the model coefficients from regression results deviate from zero when the values are not normally distributed, which makes it more difficult to compute confidence intervals. Therefore, in the case when the assumption of normality is violated, the statistical validity of the parameter will not be assessed. (Gujarati, 2004)

Table 10 normality test result

Normality test, Skewness/kurtosis					
Variables	Observation	P(skewness)	P(kurtosis)	Adj chi2(2)	Prob>chi2
e	30	0.5788	0.6112	0.59	0.7447

Source: own survey result, 2024

The above table shows the testing of normality which has included 30 observations and the probability of Skewness is normally distributed because p-value of Skewness is greater than 0.05 which is 0.5788. The probability of Kurtosis also indicates that it is normally distributed with the 0.6112 p-value of kurtosis which is greater than 0.05. The p-value of the chi2 is also 0.7447. Therefore, depending on our result from the test we can conclude it is normally distributed.

4.12.5 Autocorrelation test

The reason for testing the autocorrelation is the ARDL model assumes the covariance among the error terms over time is zero, which implies they are not correlated. When there is a serial correlation in the model, the variance in the regression coefficient will be biased which leads to unreliable and wrong significance level from the t-statistics. (Brooks, 2019). The decision rule is, if Prob>chi2 is less than 0.05 of significance level the Alternative hypothesis of no serial correlation can be rejected.

H0: No Serial Correlation

H1: Serial Correlation

Table 11 auto correlation test result

Bresusch-godfrey LM for autocorrelation			
H0: no serial correlation			
Lags(p)	Chi2	Df	Prob>chi2
1	0.901	1	0.3425

Source: own survey result, 2024

The above table shows that the results of autocorrelation for model is; prob >Chi2 (0.3425) which is greater than (0.05) significance level. As a result, we accept the null hypothesis.

4.12.6 Ramsey RESET

The Ramsey RESET test is performed to find out the non-linear combination of the explanatory variables if they have any power in explaining the response variable and stability of the model. It tests for the omitted variables, which means that some variables will have more power of affecting the result than the others, in that case the result we have will be inconsistent and invalid. (Ramsey, 1969). In order to avoid the biased result, we test the model for omitted variables which is the ramsey reset test.

Table 12 omitted variables test result

Ramsey RESET test using power of the fitted values of lnRSCA	
H0: model has no omitted variables	
F (3,20)	1.28

Prob>f	0.3079
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Chapter five

5 Summary, Conclusion, and Recommendation

5.1 Introduction

The main goal of this study is to assess the factors that affect the export competitiveness of Ethiopia on coffee. Depending on the analysis and interpretations, the summary, conclusion, recommendation, and direction for future researchers is given in this chapter.

5.2 Summary

On this study the factors that affect the competitiveness of Ethiopia on exporting coffee is addressed. To accomplish this, a quantitative method of research was used to assess the six explanatory variables such that the domestic production of coffee, world production of coffee, world price of coffee, the real effective exchange rate, the stock of foreign direct investment inflows, and the total export volume of coffee to the dependent variable of export competitiveness. To explain the variable that affect the coffee export competitiveness, the study analyzed secondary data from different sources over 30 years of period which includes from 1993 to 2022.

The study used different tests to examine and review the data on the variables that affect the coffee export competitiveness including the normality and stationarity test. The data were analyzed using the ARDL model, heteroscedasticity, multicollinearity, serial autocorrelation, and multiple regression tests.

The outcomes from the model analysis show that in the long run the variables $\ln DPro$, $\ln WPri$, $\ln REER$, and $\ln TExV$ have statistically significant impact on the RSCA while on the short run $\ln DPro$, $\ln WPro$, $\ln WPri$, and $\ln REER$ have significant impact on the competitiveness of Ethiopia. $\ln DPro$ has a positive and statistically significant (at 10% level of significance) factor on the RSCA. Other variables remaining constant, a unit increase in the domestic production of coffee increases the competitiveness of Ethiopia by 0.30 percent. In the short run $\ln DPro$ has a positive and significant effect at 5% level of significance level, which means other variables remaining constant the domestic production increasing in one unit will increase the RSCA with

0.199 percent. In the long run the $\ln WPro$ has a negative but statistically insignificant effect on the RSCA at all level of significance. But in the short run world production has a negative and statistically significant at 1% level of significance, which means other variables remaining constant a unit increase in the world production decreases the RSCA of Ethiopia by 0.35 percent in the short run. Both in the long run and short run the $\ln WPri$ has a negative and statistically significant at all level on the competitiveness of Ethiopia. Which means in other word, other variables remaining constant a unit increase on the world price decreases the RSCA of Ethiopia by 0.23 and 0.27 percent in the long run and short run respectively. The outcome of the model estimation shows that the $\ln FDI$ on both the short run and long run has negative effect on the competitiveness of Ethiopia on export of coffee but it is statistically insignificant. On this study the result of the model shows the $\ln REER$ on both the short run and long run has a negative and statistically significant effect on the competitiveness of Ethiopia on coffee with 5% and 10% significant level respectively. Other variables remaining constant the $\ln REER$ increasing in one unit will decrease the RSCA with 0.18% on the short run and 0.24% decrease on the long run. The $\ln TExV$ has a positive and statistically significant (at 10% level of significance) factor on the RSCA on the long run. Other variables remaining constant, a unit increase in the total export volume of coffee increases the competitiveness of Ethiopia by 0.19 percent. In the short run $\ln TExV$ has a positive and insignificant effect at all level of significance.

As a result, the impact of domestic production and total export volume of coffee is significant and has a favorable effect on the export competitiveness of coffee. On the other hand, the impact of world production of coffee, world price of coffee, and real effective exchange rate has a significant and negative impact on the competitiveness of Ethiopia on the export of coffee. In general, the domestic production of coffee, world production of coffee, world price of coffee, and the real effective exchange rate has significant effect on the short term, whereas on the long term the domestic production of coffee, world price of coffee, the real effective exchange rate, and the total export volume of coffee has a significant impact.

5.3 Conclusion

Increasing in the volume of exports are commonly considered as the key element for economic growth of developing countries. By exporting to the international market, the living standard on many house hold of the country is enhanced, the fact the process of exporting goes through

number of processes in every sector. Even though suppliers and exporting companies play the vital role in developing the economy, there are factors that hinder the development and sustenance in the international market.

In Ethiopia most of the exported items are agricultural commodities and among this coffee has the most share of exported commodity. In reference to recent years, last decade have a decline on the competitiveness and comparative advantage as seen on the RCA and RSCA of the country. To observe these factors a time series analysis was used in the study and analyze the competitiveness of the country in reference to top coffee producing and exporting countries in the world.

According to the result of analysis, the country's competitiveness of exporting coffee depends directly on the domestic production level and the volume the county exports. As the production level increases the county will have a commodity to export without causing a scarce in the country for the domestic consumers. Likewise, the higher the volume of export the higher the competitiveness index and will help maintain the competitiveness in the coffee export. On the other hand, as the world produce more coffee in a given crop year the higher the competition in maintaining the competitiveness, as a result the index for the country will drop. The same goes to the price of coffee, where the purchasing price of coffee increases, the more the competition which most producing countries tries to sell the commodity for the price, this will result for higher competition. In addition, as the value of currencies of major trading partner increases so does the competition so as the real effective exchange rate increases the coffee exporting competitiveness decreases.

In conclusion, based on the ARDL model result, all explanatory variables have a significant effect to the export competitiveness except for the inflow of foreign direct investment. As a result, these variables can explain the impact on the export competitiveness. From the coefficient of the regression analysis both in the short and long run, we can identify the variables affecting the competitiveness accordingly.

5.4 Recommendation

Based on the result of the study the following recommendations are made:

- In maintaining the coffee export competitiveness of Ethiopia, the government should encourage and give incentives to producing farmers of coffee and exporters of coffee, because as the domestic production of coffee and export volume of coffee increases so does the competitiveness of Ethiopia on coffee. In which by reducing the barriers in the working environment.
- The government should strengthen the competitiveness of coffee exporting sector by facilitating the technological advancement in the production of coffee, creating awareness to the stake holders about the competitiveness of coffee export, addressing the problems faced by the exporters in the process of exporting i.e. barriers faced when exporting and organizing events to promote Ethiopian coffee to the world, and opening a discussion panel to observe the problems.
- As the empirical result suggests, when the competition around the world become higher, the policy makers have to make the necessary amendment to help the exporters maintain the volume in reference to the world, which will help in sustaining the competitiveness of the sector.
- The country Ethiopia has a relative comparative advantage on the coffee commodity, which helps in having a higher competitiveness index. Even though, Ethiopia has other agricultural commodities exporting to the international market, the country obtains the relative comparative advantage on the commodity coffee. This shows more attention has to be given from the government and private sectors to the commodity coffee to

5.5 Direction for future research

A researcher can use this study as a reference material while conducting their study on the export competitiveness of Coffee in Ethiopia and or other countries experience. From the regression result, the world price of coffee affects the competitiveness of Ethiopia on coffee negatively, which contradicts with prior study. As a result, future researcher can give emphasis on the effect of world coffee price on the competitiveness of coffee export in Ethiopia. In addition, the study has a limitation on source of data which used purely secondary data, but primary data can be collected as a reference and in-depth explanation of the variables as well as understanding. Furthermore, using different models and approaches of analysis to see the difference and explore the most appropriate analysis.

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Appendix

lnRSCA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnRSCA						
L1.	-.0911445	.1474079	-0.62	0.546	-.4073031	.2250141
L2.	.301071	.2109511	1.43	0.175	-.1513741	.7535161
lnDpro						
--.	.0764029	.0929829	0.82	0.425	-.1230256	.2758315
L1.	-.033612	.105577	-0.32	0.755	-.2600521	.1928282
L2.	.1991778	.0926705	2.15	0.050	.0004192	.3979363
lnWPro						
--.	-.2958314	.1600874	-1.85	0.086	-.6391848	.047522
L1.	-.1526996	.1266366	-1.21	0.248	-.4243081	.1189089
L2.	.3596663	.1203997	2.99	0.010	.1014345	.617898
lnWpri						
--.	.0979365	.0581546	1.68	0.114	-.0267928	.2226657
L1.	-.2799671	.0697822	-4.01	0.001	-.4296349	-.1302992
lnFDI	-.0007223	.0148523	-0.05	0.962	-.0325773	.0311327
lnREER	-.1898244	.0835737	-2.27	0.039	-.3690722	-.0105766
lnTExV	.1498846	.1023841	1.46	0.165	-.0697073	.3694766
_cons	-2.009938	1.898322	-1.06	0.308	-6.081434	2.061557

D.lnRSCA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
ADJ						
lnRSCA L1.	-.7900735	.2492685	-3.17	0.007	-1.324701	-.2554458
LR						
lnDpro	.306261	.173468	1.77	0.099	-.0657907	.6783128
lnWPro	-.1124766	.1878407	-0.60	0.559	-.5153548	.2904016
lnWpri	-.2303971	.0828282	-2.78	0.015	-.4080459	-.0527482
lnFDI	-.0009143	.0187826	-0.05	0.962	-.0411988	.0393703
lnREER	-.2402617	.1161582	-2.07	0.058	-.4893963	.0088729
lnTEExV	.1897098	.106278	1.79	0.096	-.038234	.4176535
SR						
lnRSCA LD.	-.301071	.2109511	-1.43	0.175	-.7535161	.1513741
lnDpro D1.	-.1655658	.0824874	-2.01	0.064	-.3424837	.0113521
LD.	-.1991778	.0926705	-2.15	0.050	-.3979363	-.0004192
lnWPro D1.	-.2069667	.153973	-1.34	0.200	-.5372059	.1232726
LD.	-.3596663	.1203997	-2.99	0.010	-.617898	-.1014345
lnWpri D1.	.2799671	.0697822	4.01	0.001	.1302992	.4296349
_cons	-2.009938	1.898322	-1.06	0.308	-6.081434	2.061557

. regress lnRSCA lnDpro lnWPro lnWpri lnFDI lnREER lnTExV							
Source	SS	df	MS	Number of obs	=	30	
Model	.188921881	6	.03148698	F(6, 23)	=	6.89	
Residual	.105113148	23	.004570137	Prob > F	=	0.0003	
				R-squared	=	0.6425	
				Adj R-squared	=	0.5493	
Total	.294035029	29	.010139139	Root MSE	=	.0676	

lnRSCA	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnDpro	-.0196239	.0937952	-0.21	0.836	-.2136539	.1744062
lnWPro	.1536221	.1249156	1.23	0.231	-.1047855	.4120298
lnWpri	-.0645397	.0523904	-1.23	0.230	-.1729174	.0438381
lnFDI	-.0047348	.0166529	-0.28	0.779	-.039184	.0297145
lnREER	-.1886105	.1001857	-1.88	0.072	-.3958604	.0186395
lnTExV	.2589599	.090953	2.85	0.009	.0708093	.4471105
_cons	-4.432913	1.712982	-2.59	0.016	-7.976486	-.8893404

. vif		
Variable	VIF	1/VIF
lnDpro	8.16	0.122534
lnTExV	8.00	0.125009
lnFDI	6.04	0.165441
lnWPro	5.83	0.171483
lnREER	3.85	0.259953
lnWpri	2.62	0.381907
Mean VIF	5.75	

. corr lnRSCA lnDpro lnWPro lnWpri lnFDI lnREER lnTExV							
(obs=30)							
	lnRSCA	lnDpro	lnWPro	lnWpri	lnFDI	lnREER	lnTExV
lnRSCA	1.0000						
lnDpro	0.4702	1.0000					
lnWPro	0.6696	0.7706	1.0000				
lnWpri	0.1056	0.6688	0.3471	1.0000			
lnFDI	0.6268	0.7883	0.8619	0.2922	1.0000		
lnREER	0.3801	0.8323	0.7715	0.5185	0.7123	1.0000	
lnTExV	0.6828	0.8740	0.8698	0.5375	0.8507	0.8046	1.0000

```
. estat hettest
```

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity

Ho: Constant variance

Variables: fitted values of lnRSCA

chi2(1) = 0.83

Prob > chi2 = 0.3629

```
. sktest e
```

Skewness/Kurtosis tests for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)	joint	
				chi2(2)	Prob>chi2
e	30	0.5788	0.6112	0.59	0.7447

.

```
. estat bgodfrey, lag(1)
```

Breusch-Godfrey LM test for autocorrelation

lags (p)	chi2	df	Prob > chi2
1	0.901	1	0.3425

H0: no serial correlation

Ramsey RESET test using powers of the fitted values of lnRSCA

Ho: model has no omitted variables

F(3, 20) = 1.28

Prob > F = 0.3079