The Determinants of Agricultural Commodity Export Performance in Ethiopia: A Dynamic Panel Data Approach

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Declaration

I, Habtamu Bizuneh, declare that this research paper entitled ―The Determinants of agricultural commodity export performance in Ethiopia: A Dynamic Panel Data Approach ― is my original work submitted for the award of the fulfillment of the requirement for the degree of Master of Science in economics at Addis Ababa University. It has not been presented for the award of any degree or other similar titles in any other institutions of higher learning to the best of my knowledge, and all resources used have been duly acknowledged.

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Approval of the Thesis by the Examiners

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This is to certify that the research thesis presented by Habtamu Bizuneh, titled—The Determinants of Agricultural Commodity Export Performance in Ethiopia: A Dynamic Panel Data Approach in partial fulfillment of the requirement for the degree of Master of Science (MSc.) in Economics compile with the regulation of the university and confirms to the acceptable standards with the respect to the originality and the quality.

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Abstract

This paper primarily aims to explore the factors affecting Ethiopian agricultural exports using a dynamic panel data approach. The study analyzed panel data for Ethiopia's three main agricultural export commodities (coffee, oilseeds and fruit and vegetables) from the period 1999/2000 to 2022/23, considering factors such as data availability, export volume and export value, among others. Moreover, the study employed the natural logarithm of each commodity's export value alongside determinants like previous export performance, exchange rate, consumer price index (CPI), foreign direct investment (FDI), indirect tax revenue, and trade openness to make interpretation of the results easy. The findings indicate that all these independent variables significantly influence Ethiopia's agricultural exports. Specifically, the lag agricultural exports, exchange rates, foreign direct investment and trade openness have a positive and significant impact, while indirect tax revenue and consumer price index negatively affect export value. Based on these results the author recommends that the Ethiopian government should promote tax cut incentives for exporters, reduce trade barriers on import of agricultural inputs and subsidize agricultural inputs such as seeds, fertilizers, and equipment.

Keywords: Ethiopia, Agricultural Export Commodity, System GMM, Panel Data

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List of Acronyms

CPI: Consumer price index

CSA: Central Statistical Agency

DPD: Dynamic Panel Data

ETB: Ethiopian Birr

FDI: Foreign Direct Investment

GDP: Gross Domestic Product

GMM: Generalized Method of Moments

IMF: International Monetary Fund

IT: Indirect Tax

MoFEC: Ministry of Finance and Economic Corporation

NBE: National Bank of Ethiopia

REER: Real effective exchange rate

TOP: Trade openness

UN: United Nations

USD: United States' Dollar

WTO: World Trade Organization

CHAPTER ONE

1 INTRODUCTION

1.1 Background of the Study

Exports play a crucial role in the economic growth of any country, particularly for developing nations like Ethiopia. As a primary driver of foreign exchange earnings, exports help finance imports, boost employment, and foster economic development. The relationship between exports and economic growth is multifaceted, involving several economic channels through which exports contribute to both short-term and long-term growth.

Exports play a vital role in the economic development of countries, particularly in developing regions like Asia and Africa. Although these regions may not command a substantial share in the global market, exports remain a key driver of economic growth, job creation, and poverty reduction. Developing economies depend heavily on exports to boost their foreign exchange reserves, support domestic industries, and integrate into the global economy (Anyanwu, 2014, cited in Geyer, 2019).

Exports generate foreign exchange reserves essential for financing imports of necessary goods for capital development and domestic production. He argues that the increase in export revenue can positively impact a country’s balance of payments and is avital for generating job opportunities. Additionally, he points out that a rise in exports may encourage specializations in the production of export commodities, thereby enhancing productivity and output within the export sector (Kebede, 2011).

The expansion of agricultural exports is one of the most promising sources of income growth for developing economies like India, China, Pakistan, Indonesia etc. However, these countries' reliance on agriculture for their exports causes greater swings in their economic performance. This is due to a number of internal and external obstacles limit these agricultural exports, which prevents the countries' agricultural exports from growing (Johnston and Mellor, 1961).

African countries, being developing nations, have export potential to achieve rapid economic growth; there are still many obstacles and uncertainties. The continent's social and economic conditions are susceptible to both internal and foreign shocks. The primary challenges hindering African countries from sustaining their economic growth or progress includes unfavorable weather conditions, conflicts, insufficient investments to diversify their economies, and deterioration in trade terms (IMF reports, 2011).

Ethiopia, being in Sub-Saharan Africa (SSA), primarily relies on agricultural commodities for its exports. According to UNDP data from 2018, agriculture accounted for approximately 70% of Ethiopia’s total exports. Agriculture is fundamental to numerous economic activities, such as marketing, processing, and exporting agricultural commodities. Even though subsistence farming accounts for the majority of the country’s production, the smaller cash crop sector plays the vital role in country’s commodity export.

Ethiopia’s economy is primarily driven by agriculture, which remains the main source of income for the majority of the population. The vast majority of Ethiopians still depend on agriculture for their livelihoods, making it the cornerstone of the country’s economic structure. Agriculture is not only critical for providing employment but also for contributing to export earnings and GDP. In fact, the agricultural sector accounts for approximately 40% of Ethiopia's GDP, highlighting its central role in the national economy (Ibrahim, 2006**)**.

Because of unfavorable global demand and the low income elasticity of demand for agricultural products, a nation dependent on exporting primary goods is considered to experience a lower economic impact. Besides, slower growth can be a result of lack of skills and technology in producing these export commodities, as well as the existence of weaker backward and forward linkage with the rest of the economic activities (Bengali & Fukasak, 2013).

A small number of primary agricultural commodities that are subject to abrupt swings in both internal and external factors account for a large portion of Ethiopia's exports. Similar to other emerging nations, Ethiopia's export sector has seen short-term ups and downs due to the nature and concentration of its commodities. For example, throughout the past thirty years, Ethiopia's top export product has continued to be only coffee, which is followed by oilseeds and pulses. However, throughout time, Ethiopia's overall exports have seen a decrease in the percentage of coffee exports (IMF report, 2011).

The national bank of Ethiopia (NBE, 2018) highlighted that Ethiopia is currently encountering challenges regarding its foreign exchange earnings. For the past two decades, the country has experienced a persistent trade deficit, necessitating borrowing to address this shortfall, which in turn has led to a significant scarcity of foreign exchange and an elevated debt burden. As of NBE (2018), the debt-to- GDP ratio of the country was 26% in 2016.

To deal with those problems, the Ethiopian government has introduced several policy initiatives aimed at enhancing export performance. These include simplifying the export licensing process, devaluing the national currency (Birr), providing 70% loan for export related investment, implementing a preferential interest rate that is 3.5% lower than that for non-export loans, and allowing exporters to retain 10% of their earnings in foreign currency (Bekele & Mersha, 2019).

The Ethiopian government also utilized various strategies to enhance exports. These included devaluing the Birr, simplifying the import and fare authorization processes, lowering taxes, and offering incentives to exporters. Additionally, exporters and their subsidiaries were exempted from certain taxes, export-oriented investments were encouraged, duty drawbacks and foreign exchange retention schemes were implemented, and export promotion agencies were established as well (Haile,1999).

Despite the government’s initiatives, the disparity between Ethiopia’s exports and imports has widened over the last two decades. For instance, exports increased only from USD 482 Million in 2000 to USD 2,785 Million by 2016. In contrast, imports surged dramatically, jumping from USD 1,392 Million in 2000 to USD 16,244 Million in 2016 (NBE,2018).

Given the aforementioned points, Ethiopia’s trade balance continues to deteriorate. This decline is largely due to the country’s heavy reliance on export of primary agricultural commodities, which are less competitive in the global market and have a lower value compared to industrial goods produced by developed nations. Despite these challenging scenarios, Ethiopia remains heavily dependent on agricultural commodity exports; however, the impact of this reliance on economic growth has not been thoroughly examined in recent years (Sawore, 2015).

Therefore, this paper aims to identify the key factors influencing the growth of agricultural export performance for specific major commodities and analyzes the primary destinations for Ethiopia's exports. Moreover, the study highlights the effect of agricultural exports on the country's economic growth.

1.2 Statement of the problem

No nation exists in total isolation or self-sufficiency. As a result, every nation engages in trade with others to obtain goods and services that are produced more efficiently elsewhere, based on comparative advantages in production costs. This is particularly true for developing countries like Ethiopia, where a significant portion of the workforce is employed in agriculture, while only a small percentage is involved in the tertiary or manufacturing sectors.

Economic growth and structural transformation in developing agrarian economies are deeply linked to their capacity to import capital goods, technology, and services necessary for industrialization and modernization. These economies, which often rely heavily on agriculture, need to diversify and expand their productive capacity to foster sustained growth. The ability to import essential goods such as machinery, equipment, and advanced technologies directly depends on the foreign exchange earnings generated through exports. In this context, a country's export performance not only drives the inflow of foreign currency but also supports the acquisition of capital goods that are critical for upgrading infrastructure, enhancing productivity, and promoting industrial development (Barrett et al., 2019; Matthess & Kunkel, 2020).

Ethiopia's economic performance has generally been unsatisfactory. Despite accounting for almost 67% of all employment, agriculture has been operating at a subsistence level. In contrast, the industry and service sectors employ 9% and 24% of all employment in 2019–20, respectively Between 2011 and 2020, Ethiopia's agriculture sector grew at a pace of about 5.50% annually, far slower than the country's service and industrial sectors, which grew at 9.96% and 18.06%, respectively (World Bank, 2020).

The contribution of agricultural sector to GDP has dropped over time. His findings indicate that both the volume and value of agricultural production, as well as the export of agricultural commodities, have decreased due to population growth, inadequate technological advancements, and inefficient resource allocation, which have led to reduced availability of natural resources for the majority impoverished farmers (Wassie, 2020).

The agricultural exports have experienced varying levels of success over the past three decades. This slower growth was attributed to, as per his findings, political instability, institutional changes, and shifts in government systems, legal framework developments, and other related factors. After the collapse of Derg, the EPRDF government introduced new opportunities for exporters, traders, and producers by promoting trade liberalization. Nevertheless, from 1995 to 2001, the annual growth rate of agricultural exports was just 4.6 percent. This stagnation was largely due to the two-year conflict between Ethiopia and Eritrea, which severely depleted the industrial resources (Bantie, 2019).

Ethiopia's growth has slowed due to the growing macroeconomic imbalance, which causes lower foreign exchange in the economy. Although foreign direct investment, aid, and remittances have supplied their fair share of foreign earning over the past 20 years, external borrowing has been essential to finishing the committed investments, particularly since 2009. Ethiopia was forced to reduce its imports after its access to concessional loans ended in 2015 due to the nation's poor export performance, which in turn resulted in a slowdown in growth in the latest. To make the matters worse, the drought of 2001 and 2002 significantly harmed the overall

performance of the agricultural sector. Since 2000, exports have dropped by an average of 18.6 percent (Tolcha, 2020).

Considering the crucial role of agricultural exports in Ethiopia's economy, it is essential to analyze the effects of both demand and supply side factors on these export commodities. Factors like GDP, exchange rates, labor force, trade ploicies and institutional quality all play a significant role in determining Ethiopia's agricultural exports (Karamuriro, 2015;Geda &Seid, 2015; Kebede, 2016; Bntie, 2019; Bereket, 2020).

Zekarias and Degye (2019) used co-integration and Vector Error Correction methods to evaluate the factors influencing coffee export from 1977 to 2016. His finding indicates that coffee export has a long-run inverse relationship with global coffee production and supply as well as a direct relationship with price and labor force.

Hassen (2015) conducted a study examining the factors influencing coffee exports of Ethiopia covering the year from 1965 to 2005, utilizing an Error Correction model. His findings indicated that, in the long run, Ethiopia's coffee export supply is significantly and negatively associated with relative domestic prices, real exchange rates, and terms of trade; however, the influence of foreign capital flow was found to be insignificant. He also demonstrated that real income has a positive and significant effect in the long term or run.

Taddese (2015) employed a Vector Auto Regressive and Error Correlation approach to analyze the key factors affecting Ethiopia's coffee export supply from 1981 to 2011. His study revealed that infrastructural development, trade openness, and the real export prices of coffee have positive impact on the supply of Ethiopia's coffee for export.

Nonetheless, theories and data indicate that Ethiopia's exports, like other developing nations, are mostly agricultural primary products, which makes it more likely to identify the key factors influencing agricultural export through the use of dynamic panel data analysis. Furthermore, to get a deeper understanding of the dynamics influencing Ethiopia's agricultural export flows; no empirical studies utilizing a dynamic panel model with the latest data have been conducted.

Despite the fact that the export industry is vital to the nation, there is not a lot of literature available on the subject, especially regarding the factors that influence export performance. Furthermore, the few previous studies conducted in Ethiopia focused too much on single commodities like oil seeds, coffee, and horticulture crops. They have neglected to consider the influence of demand-side factors from outside their country. Besides, there hasn't been agreement among writers on what factors and indicators are most important for export performance.

This study, is therefore, aims to address these overlooked areas by exploring fundamental questions such as: What are the key factors influencing agricultural exports in Ethiopia? How do these factors impact Ethiopian exports? What is the connection between agricultural exports and economic growth? Which countries are the primary destinations of Ethiopia's exports? Additionally, policymakers, government officials, exporters, and researchers may find this article beneficial for developing and shaping policies, as well as a potential reference source.

1.3 Research Questions

The paper aimed to address the following primary research questions;

1. What are the trends and main destinations of Ethiopia's exports?
2. What are the key factors influencing the volume and value of agricultural exports?

1.4 Objectives of the Study

1.4.1 General Objective of the Study

The primary objective of the study was to assess the key factors influencing the performance of agricultural commodity exports in Ethiopia.

1.4.2 Specific Objective of the Study

The specific aims of the study were to;

1. Analyze the tends of major agricultural export products from Ethiopia and their target markets;
2. Determine the main factors affecting the performance of agricultural exports;
3. Evaluate the connection between agricultural exports and economic growth

1.5 Scope of the Study

The study focused on Ethiopia's key agricultural exports, namely coffee, oilseeds, and fruit and vegetables, to international markets. The study analyzed the factors affecting the volume and value of the important agricultural commodity exports over a span of twenty-three years, from 1999/2000 to 2022/23.

1.6 Significance of the Study

Export knowledge plays a crucial role in driving Ethiopia's economic development by equipping businesses and policymakers with the tools needed to navigate global markets effectively. It also enhances the competitive capacity of Ethiopian products, allowing them to meet international standards and increasing their market share abroad. This, in turn, boosts economic growth through higher revenues from exports. Over time, fostering export expertise leads to a more resilient and diversified economy, as the country becomes less dependent on a narrow range of goods and can tap into a broader spectrum of international trade opportunities. By strengthening export capabilities, Ethiopia can better adapt to global market changes and sustain long-term growth (Ipek, 2020)..

Therefore, the study provides interested parties information about the behavior of major agricultural exports and the rationale behind it. The study then aims to tell the government about the main areas of agricultural export focus and how to develop suitable interventions in case policy changes are required to address the focus areas.

1.7 Organization of the Study

The paper is structured into five chapters: Chapter one introduces the study and outlines its goals. Chapter two examines relevant theoretical and empirical literature. Chapter three describes the research methodology, including model specification, estimation methods, and variable definitions. Chapter four presents the results of the data analysis. Lastly, Chapter five summarizes the findings and provides recommendations based on the study's results.

CHAPTER TWO

2 LITERATURE REVIEW

2.1 Theoretical Literature

2.1.1 Conceptual Framework

Agriculture is the practice of cultivating soil, growing crops, and raising animals for food, fiber, medicinal plants, and other products used to sustain and enhance human life. It is a broad field that encompasses various activities, including farming, horticulture, livestock breeding, and the processing of raw materials for consumption or trade.

Many underdeveloped countries are known by their dependency on export of primarily raw materials and agricultural products. Ethiopia is no exception, where the export sector is dominated by primary commodities. However, the country's export performance remains low, contributing to a weak balance of payments. The root causes of Ethiopia's poor export performance can be traced back to insufficient investment in the export sector overall, and more specifically, in the agricultural sector (Qiu et al., 2019; Maitra et al., 2021).

Agricultural commodities are the primary source of exports for Ethiopia, and various factors influence their competitiveness in global markets and their role in driving economic growth. The relationship between agricultural exports and economic growth is interlinked. As the economy expands, it can provide better agricultural inputs, which boosts productivity. This, in turn, leads to an increase in the volume of agricultural exports, further contributing to economic growth. Although Ethiopia exports minerals, power, and other manufactured products, the study focused on the export of agricultural products as they are the primary export commodities of the country.

2.1.2 Definition of Variables

2.1.2.1 Value of Agricultural Export

This represents the volume and value of agricultural commodities exported from Ethiopia, which is the outcome of interest. Agricultural exports are influenced by various internal and external factors such as exchange rates, trade openness, foreign direct investment (FDI), and consumer price index, indirect tax and its past values.

2.1.2.2 Trade Openness (TOP)

Trade openness indicates how much a country’s economy is geared towards international trade. An out-oriented economy actively seeks opportunities to engage in trade with other nations, while an inward-oriented economy is less involved or unable to take full advantage of global trade prospects. Various factors influence a nation’s trade orientation, including policy decisions related to trade barriers, import-export regulations, infrastructure development, technological process, economies of scale, and market competitiveness.

Trade openness defined as the sum of imports and exports relative to GDP, is selected as a proxy for the dependent variable because it reflects shifts in international trade, separate from the broader GDP view of the economy. A higher trade openness ratio signals a more liberalized economic environment.

TOP=$Import+Export$/GDP.....(3.3)

2.1.2.3 Exchange Rate

The exchange rate reflects the value of one currency compared to another currency, indicating how much of one currency can be exchanged for another. When a country's currency loses value against others, its exports become cheaper for buyers using those currencies. This leads to increased demand for the country's products and services in international markets, boosting export volumes or values.

2.1.2.4 Consumer Price Index (CPI)

The consumer price index measures the average changes in prices for a range of goods and services over time, providing insights into how consumer costs fluctuate. Its primary goal is to gauge the overall price level in an economy, which helps assess the purchasing power of a nation's currency.

In theory, exports and inflation have an inverse relationship. Inflation generally increases the price of goods and services in the global market. However, the impact on exports depends on the elasticity of demand for domestic products in other countries. If export demand is relatively inelastic, rising prices due to inflation might not significantly affect export volumes (Fleming, 1962;Mundell, 1963).

2.1.2.5 Indirect Tax

An indirect tax levied by an intermediary in the supply chain, such as a manufacturer or retailer, and is ultimately passed on consumers through the increased price of gods and services. This can adversely affect a country's exports by raising the price of exported goods and increasing costs for exporters. To solve this impact, the governments may provide fiscal incentives, such as tax exemptions, to support the export sector (Emran & Stiglitz, 2005; Khurana & Sharma, 2016).

2.1.2.6 Foreign Direct Investment (FDI)

Foreign Direct Investment (FDI) involves a situation where an organization from one nation obtains a controlling interest in a business or asset situated in another nation. Inflows of FDI have a beneficial impact on agricultural exports, showing notable direct and spillover effects on exports in both the short and long term (Z Wen, L Zhuang, R Zhang - Global Economic Review, 2020). Consequently, we anticipate a positive correlation between foreign direct investment (FDI) and the value or quantity of agricultural exports.

2.1.2.7 Log of Export (LAG of Export)

The historical performance of agricultural exports can influence current export trends. The lag effect suggests that past export levels can shape future export performance, as exporters adapt to past experiences and market conditions. This variable considers the effect of previous agricultural export trends on current export activities.

2.1.3 Theories of international trade

2.1.3.1 Mercantilists trade theory

During the 17th and 18TH centuries, individuals including merchants, bankers, government officials and philosophers discuss about international trade, collectively contributing to the development of commercial economics. In this case, mercantilists argued that a nation's strength and prosperity depended on its ability to export more goods than it imported. They believed that a nation's wealth and power grew in accordance with the accumulation of gold and silver. Consequently, governments needed to strive to boost their country's export while discouraging and restricting imports, particularly luxury goods.

Nonetheless, since not all countries could simultaneously achieve export surplus and the supply of gold and silver was restricted, one nation could only benefit at the expense of others. As a result, mercantilists promoted economic nationalism, which often conflicted with the national interest of other nations (Salvatore, 2013).

2.1.3.2 Classical Trade Theory

Adam Smith proposed that trade between two nations relies on absolute advantage. Both countries can from trade if they each specialize in producing certain good they can produce more efficiently and trade part of their output for goods they produce less efficiently. This is to say that one country should be more efficient in producing a certain good or has absolute advantage but less efficient in producing or disadvantaged in another. As a result, this specialization increases the production of both goods and optimizes resource use, allowing the benefits of specialization to be shared between two nations through trade (Salvatore, 2013).

In 1817, Richardo introduced the law of comparative advantage. According to this principle, although one nation is less efficient in production of both goods compared to another nation (absolute disadvantage), trade can still be beneficial for both parties. The law of comparative advantage suggests that the less efficient nation should focus on producing and exporting the good in which it has the least disadvantages relative to the other nation, while importing the good in which it has the greatest disadvantage (Salvatore, 2013).

2.1.3.3 Neoclassical Trade Theory

In the late 19th and early 20th centuries, the development of neoclassical economic theory offered more precise tools for analyzing the effects of international trade. Among these neoclassical theories, the Heckscher-Ohlin theory strongly suggests that the demand for goods affects the demand for the inputs needed to produce them (Salvatore, 2013).

2.1.3.4 Imperfect Substitute Model

In the imperfect substitute model, imports and exports are not perfect substitutes for domestic goods. This model accounts for the simultaneous presence of both domestic and imported products (Goldsein & Khan, 1978). In this framework, consumers aim to maximize their utility while adhering to budget constraints. The demand for exports is influenced by the gross domestic product, prices of domestic and imported goods, exchange rates, and tariffs, which is best described as demand function (Salvatore, 2013).

The imperfect substitution model explores the connection between two commodities that share similarities but are not identical. According to this model, commodities or goods are categorized as imperfect substitute when consumers perceive differences in quality, brand, or other attributes which distinguish them from each other.

According to casual observation, perfect competition or any close approximation of it is rarely found outside of peasant agriculture and certain service sectors. In various manufacturing fields, dominance by a few firms is common, often leveraging their market power extensively. This phenomenon is observed in both wealthy nations and emerging economies, but imperfect competition appears to be more widespread in the industrial sectors of emerging nations compared to industrialized ones.

2.2 Empirical Literature

Numerous studies give different perspectives on the factors determining agricultural exports. For instance, some researches examine the impact of exchange rate on agricultural exports. Whereas, some researches focus on how fluctuations in the nominal exchange rate affect exports, policymakers generally prefer the real exchange rate as it considers the differences in purchasing power between the currencies of trading partners. Unlike

nominal exchange rate, where an increase indicates depreciation, a rise in the real exchange rate indicates currency appreciation, which has different implications for exports.

Research by Allaro (2015), Berekt(2020), karagoz (2015), Karamuriro& Karukuza(2015), and Siyakiya(2016) revealed mixed results concerning the impact of exchange rate on export volume. Mengistu(2014),, Sertoglu & Dogan (2016), Victoria & Samuel(2017), and Zeray & Gachen(2014) specifically found a positive and statistically significant association between exchange rate and export volume, whereas other studies reported a negative relation.

Naddem et al. ()2012 analyzed the factors affecting Pakistan's export performance using time series data from 1981 to 2011 and found that taxiation, income levels and exchange rates influenced export performance. In the study, Pakistan's export volume was the dependent variable, while global income gowth, GDP, fpreign direct investment (FDI), nominal exchange rate, indirect taxes, and industrial value added are the independent variables. The results indicated that FDI has a minimal impact on export performance, whereas industrial value added, indirect taxes, global income growth, GDP, and the nominal exchange rate had positive effects on exports.

Likewise, research by Bekele & Mersha (2019), Cheffo(2020), Geda & Seid(2015), Haitho(2013), Hutchinson(2019), and Kebede(2016) has revealed a positive and significant correlation between GDP and agricultural export value. In contrast, a study by Karamuriro and Karukuza (2015) examining the deteminants of Urganda's exports using panel data from 1980 to 2012 found a negative and significant relationship between GDP and exports.

Hailegiorgis (2011) analyzed the factors influencing the export of Ethiopian oil seeds from 1974 to 2009. In his study using classical linear regression revealed that both real output and nominal exchange rate had a positive impact on the performance of oilseed exports. The study also showed the existence of insignificant relationship between oilseed export and price of domestic and foreign oilseed.

Belayneh and Wondaferaw (2013) also tried to investigate the factors affecting Ethiopia's export performance using Johansen co-integration and Vector Error Correction model covering the year from 1971 to 2011. Their findings suggested that real effective exchange rate, trade openness, Real GDP, infrastructure development, and the ratio of private credit to GDP have positive and significant influence on Ethiopia's export performance in the long run.This research offers a more comprehensive understanding of Ethiopian export dynamics.

Several studies, including these by Boansi et al. (2014), Gururaj et al.(2016), have found a significant negative correlation between agricultural export volume and foreign direct investment. In contrast, Haitho(2013) revealed a positive and significant relationship between exports and FDI in Vietnam. In addition to these, Gururaj et al.

Several studies, including those by Boansi et al. (2014), Gururaj et al. (2016), Mengistu (2014), and Zeray & Gachen (2014), have found a significant negative correlation between agricultural export volume and foreign direct investment (FDI). In contrast, Haitho (2013) reported a positive and significant relationship between exports and FDI in Vietnam.

Additionally, Gururaj et al.(2016) and Narayan & Bhattacharya (2019) identified a significant negative correlation between the consumer price index and agricultural exports. Conversly, research by Gebrehiwot &

Gebru (2015), and Sawore (2015) has shown a positive and significant relationship etween institutional quality and agricultural exports, as well as between infrastructure and agricultural exports in developing countries.

Tadese (2015) also examined the factors influencing coffee export supply in Ethiopia using Vector Autoegressive and Error Correction methods. The study found that coffee export supply increased in response to higher real export prices, greater trade openness, and improvements in infrastructure. However, changes in exchange rate had a negative impact on coffe export supply, although its effect was statistically insignificant.

According to Abebe(2016) in his study examined export determinants of Ethiopia from 1974 to 2014 using Three-Stage-Least squares. The findings revealed that real GDP, infrastructural development, real exchange rate and terms of trade all have significant and direct effects on exports. On the contrary, GDP of trading partners showed no significant impact while relative prices were negatively and significantly associated with exports.

Tasew and Brar (2016) also tried to investigate the factors contributing Ethiopia's export growth from 1995 to 2014 using constant market shares decomposition analysis. As of the study's findings the primary drivers of Ethiopian export growth during that period were total world trade and competitiveness of Ethiopian exports.

As of Zekarias and Degye (2019) study as well assessed the determinants of coffee export from 1997 to 2016 using co-integration and Vector Error Correction models. The findings asserted that coffee export had an inverse relationship with coffee production and world coffee supply. However, coffee export had a direct relationship with export price and labor force.

Moreover, Israel (2020) investigated the factors influencing export supply of Ethiopia from 1977 to 2016 using the ARDL model. As of the findings economic factors such as real GDP, terms of trade, trade openness, GDP of trading partners and investments are crucial determinants that promote exports. Israel's study is notable for its recent, comprehensive approach compared to other studies mentioned in this article although it faced limitations such as data collection from diverse sources with varying measurement units.

Fassil and Degye (2019) analyzed the factors affecting Ethiopian coffee export to 31 trading partner countries from 1998 to 2016 using the system generalized method of moments. Their findings revealed that trade openness, population size, foreign direct investment, and institutional quality index had positive and significant impact on coffee exports. Conversely, the population of the trading prtners, weighted distance, lagged export volume, and real exchange rate negatively and significantly influenced coffee exports.

Fassil and Degye (2019) analyzed the factors affecting Ethiopian coffee exports to 31 trading partner countries from 1998 to 2016 using the system generalized method of moments.

The study is notable for its extensive inclusion of various trading partners, making it more comprehensive than the research by Alelign(2014) and Murad and Beyan(2020), despite focusing on a single commodity export.

CHAPTER THREE

3 DATA AND METHODOLOGY

3.1 Research Design and Approach

The paper investigated the factors affecting agricultural export of Ethiopia's three major commodities of Ethiopia, which are coffee, oilseeds and fruit and vegetables. In doing so, the study used Dynamics panel research design for a period of Twenty –Three (23) Covering from 1999/2000 to 2022/23 years. This is due to the fact that it helps to analyze data that includes both times –series and cross-sectional dimensions. Besides, these models incorporate lagged dependent variables to account for potential endogeneity and dynamics in the data. Therefore, secondary panel data were collected from both domestics and international sources, along with relevant institutions. Qualitative research methods were also employed to ensure a comprehensive understanding of the study topic. This combination of quantitative and qualitative research methods leverages the strengths of a mixed method approach, reducing the biases associated with using only one type of study.

3.2 Data Type

The data utilized in this study was quantitative. This study used the three selected Ethiopian agricultural export commodities for the period 1999/2000 – 2022/23, based on data availability and value as well as volume of export. In the study, data on three major export goods (Coffee, Oilseeds, and vegetables), consumer price index, exchange rate, indirect tax, foreign direct investment, gross domestic product, trade openness and total export of Ethiopia were collected for a period of twenty-three years.

3.3 Data Source

To analyze the factors affecting the top three export items of Ethiopia –coffee, oilseeds, and vegetables- the study utilized secondary data obtained from the National Bank of Ethiopia (NBE), the Ethiopian Revenue and Customs Authority (ERCA), and World Bank reports for the period of twenty-three years spanning from 1999/2000 to 2022/23.

3.4 Model Specification

Trade theories have evolved to become more applicable for analyzing the factors influencing export performance. The emphasis has also been on incorporating additional determining factors in to the model in the study to enhance its comprehensiveness.

This paper utilized a dynamic panel data model employing one-step system Generalized Method of Moments (GMM). This method was selected for its ability to leverage the advantage of both cross-sectional and time series data, facilitating the analysis of individual unit across multiple time periods. Panel data provides greater variability and information than either cross-sectional or time series data alone, making it more effective for accurately identifying causal relationships and estimating parameters (Lillo et al., 2018;Sul, 2019; Zyphur, 2020).

It also offers researchers enhanced flexibility in modeling behavioral differences compared to cross-sectional data (Frees, 2004; Hsiao, 2007; Wooldridge, 2010).This paper's econometric model is based on Tesfaye(2014), Olper(2001), Majeed et al.,(2016), Idsardi (2010), Amoro& Shen (2013), Abolagba et al., (2020) with adjustments incorporating insights from Kahfi (2016), Kiani (2018), Reinert (2020), and Nasrullah et al., (2020).

Based on theoretical and empirical literature and data availability, the model of imperfect substitutes in international trade is mathematically formulated as follows:

$X_i^d = f(Y, EXR, T, P, Z)$…….…. (3.0)

Where X_i^d is the export value or volume, Y is the gross domestic product, EXR is the exchange rate, T is the tariff revenue, P is the domestic price level, and Z is the other variables.

Furthermore, the Anderson and Hsiao (1982) panel data model represents a valuable tool for addressing endogeneity and enhancing the reliability of estimates in panel data analysis. The general form of the panel data model proposed by Anderson and Hsiao (1982) is expressed as:

Yit = Xitβ + αi + εit…….(3.1)

Where,

- Yit is the dependent variable for individual i at time t

- Xit is a vector of explanatory variables for individual i at time t

- β is a vector of coefficients to be estimated

- αi is an individual-specific effect

- εit is the error term

Thus, depending on the above **Anderson** and **Hsiao** (1982), a dynamic panel data model was designed to assess the determining factors that affect Ethiopian agriculture export performance as follows:

$$\boldsymbol{lnExportit = \beta 0 + \beta 1 lnExportit - 1 + \beta 2 lnCPI + \beta 3 lnITit + \beta 4 lnExRit + \beta 5 lnTOPit + \beta 7 lnFDIit + ai + Uit} \ldots\ldots\ldots (\mathbf{3.2})$$

Where $lnExport_{it}$ is the natural logarithm of export value of an i^{th} item at year t, i = 1,2, …, 23, t = 2000, 2001, …, 2023, $lnExportx_{it-1}$ is one period lagged value of natural logarthim of export value, $lnCPI_{it}$ is the natural logarithm of the consumer price, $lnIT_{it}$ is the natural logarithm of indirect tax revenue, TOP_{it} is trade openness, $lnFDI_{it}$ is the natural logarithm of foreign direct investment, ai is the export item-specific fixed effect, $U_{it} \sim N(0, \sigma^2)$ is the random term, $\boldsymbol{ai}$ and u_{it} are independently and identically distributed.

3.5 Method of Data Analysis

This research employed both descriptive and econometric analysis techniques. Descriptive statistics, such as mean, standard deviation, minimum, and maximum values, were used to characterize economic size, export value, exchange rate, indirect tax, foreign direct investment and trade openness.

For econometric analysis, the Arellano-Bond GMM dynamic panel data was applied to investigate the impact of explanatory variables on the dependent variable. This model was chosen because it is widely recognized in econometrics and panel data analysis for addressing endogeneity and serial correlation issues in dynamic panel data. These models are also particularly effective in managing unobserved individual-specific effects and potential correlations between explanatory variables and the error term.

The Arellano-Bond model is a dynamic panel data approach that utilizes the previous value of the dependent variable as instruments endogenous regressors, helping to mitigate endogeneity concerns often present in panel data analysis. Conversely, the Arellano-Bover/Blundell-Bond model, developed by Arellano and Bover in 1995, enhances the Arellano-Bond model by adding extra moment conditions for greater efficiency. The Blundell-Bond estimator, also known as the system GMM estimator, generalizes the Arellano-Bond estimator and is specifically designed to tackle both endogeneity and serial correlation in dynamic panel data models.

Therefore, the paper used these models as they provide a robust framework for estimating parameters in dynamic panel data models and are valuable tools for analyzing complex longitudinal data.

3.6 Specification and Estimation Procedure

Numerous econometric relationships exhibit dynamic characteristics and panel data offer researchers a valuable tool to comprehend these dynamics of adjustment. These dynamic relationships typically involve including a previous value of the dependent variable among the independent variables (Baltagi, 2005; Sul, 2019; Tsionas, 2019; arker, 2020).

In a dynamic panel data approach, the autoregressive model of order p with an additional regressor (x_{it}) can be outlined according to the general framework proposed by Baltagi (2005).

$$Y_{it} = \theta_1 Y_{it-1} + \cdots + \theta_p Y_{it-p} + X'_{it}\beta + \alpha_i + \varepsilon_{it}; t = 1, \ldots., T, i = 1, \ldots., N \quad \ldots\ldots\ldots\ldots\ldots (3.5)$$

Where, αi denotes a time-invariant individual effect, which can be either fixed or random. The disturbance term εit is assumed to be uncorrelated with Xit. In our specific case, equation (1.3) simplifies to a first-order model.

In a static panel data model, choosing between fixed or random effects produces a consistent and efficient estimator. However, in a dynamic model, the choice between fixed and random effects is affected by αi, regardless of its handling (Verbeek, 2004). For a first-order autoregressive model, reliable estimates are typically obtained when the number of periods T is large (Green, 2003). Arellano & Bond (1990) introduced a two-step method that involves differencing and instrumenting, offering a consistent and effective estimation approach.

The first step involves differencing the dynamic equation to eliminate the individual effects(a_i). Cameron and Trivedi (2005) described the step as follows;

$$\Delta Y_{it} = \theta_1 \Delta Y_{it-1} + \cdots + \theta_p \Delta Y_{it-p} + \Delta X'_{it}\beta + \Delta\varepsilon_{it} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (3.6)$$

The differenced equation Δ captures the first order change in the dependent variable caused by its lagged value and exogenous regressors. It is assumed that εit are not serially correlated, as correlation would make estimators inconsistent. The next step is to use instrumental variables (IV) estimation on the first differenced model,

employing appropriate lags of dependent variable as instrument. Drukker (2008) indicated that this two-step process provides consistent parameter estimates.

Fixed or random effects panel data estimators are unsuitable for the first differenced equation. Unlike static models, applying ordinary least squares to the first difference data yields inconsistent estimaes since the regressor ΔYit-1 is correlated with the error term Δεit, even if εit is serially uncorrelated. Specifically, the first differenced model's error term Δεit= εit,- εit-1 correltes with ΔYit-1 = Yit-1 − Yit-2, since Yit-1 is affected by εit-1. However, Δεit is not correlated with ΔYit-k for k ≥ 2, making it possible to use lagged variables as instruments in the IV estimation (Cameron & Trivedi, 2005).

The Arellano-Bond estimator uses an IV approach with the assumption that E(Yik, Δεit) = 0 for all k ≤ t-2 in the levels equation, allowing the use of lags such as Yit-2, Yit-3, and Yit-4 as instruments in the differenced equation. The system GMM estimator incorporates additional conditions, like E(ΔYit-1, εit) = 0, permitting ΔYit-1 to serve as an instrument in the levels equation (Cameron & Trivedi, 2005).

Fixed or random effects panel data estimators are not appropriate for the first-difference (FD) equation. Unlike static models, applying ordinary least squares to FD data results in inconsistent estimates because the regressor ΔYit-1 is correlated with the error term Δεit, even when εit is serially uncorrelated. Specifically, the FD model's error term Δεit = εit − εit-1 is correlated with ΔYit-1 = Yit-1 − Yit-2, since Yit-1 is influenced by εit-1. However, Δεit does not correlate with ΔYit-k for k ≥ 2, allowing for instrumental variable (IV) estimation using lagged variables as instruments (Cameron & Trivedi, 2005).

The Arellano-Bond estimator employs an instrumental variable (IV) approach, operating under the assumption that E (Yik, Δεit) = 0 for all k ≤ t-2 in the levels equation. This allows for the use of lags like Yit-2, Yit-3, and Yit-4 as instruments in the first differenced equation. In the system GMM estimator, further conditions are taken into consideration, such as E (ΔYit-1, εit) = 0, which allows ΔYit-1 to be used as an instrument in the levels equation (Cameron & Trivedi, 2005).

Depending on the previous justifications, our estimated can be specified in the levels and first differenced forms as:

$$\boldsymbol{lnExportit = \beta 0 + \beta 1 lnExportit - 1 + \beta 2 lnCPI + \beta 3 lnITit + \beta 4 lnExRit + \beta 5 lnTOPit + \beta 7 lnFDIit + ai + Uit} \ldots\ldots\ldots (\mathbf{3.6})$$

$$\boldsymbol{\Delta lnExportit = \beta 1 \Delta lnExportit - 1 + \beta 2 \Delta lnCPI + \beta 3 \Delta ITit + \beta 4 \Delta ExRit + \beta 5 \Delta TOPit + \beta 7 \Delta FDIit + \Delta Uit} \ldots\ldots\ldots (\mathbf{3.7})$$

Where $lnExport_{it}$ is the natural logarithm of export value of an i^{th} item at year t, i = 1,2, …, 23, t = 2000, 2001, …, 2023, $lnExportx_{it-1}$ is one period lagged value of export, $lnCPI_{it}$ is the natural logarithm of the consumer price index, $lnIT_{it}$ is the natural logarithm of indirect tax revenue, $lnTOP_{it}$ is the natural logarithm of trade openness, $lnFDI_{it}$ is the natural logarithm of foreign direct investment, a_i is the export item specific fixed effect, $U_{it} \sim N(0, \sigma^2)$ is the random term, a_i and u_{it} are independently and identically distributed.

3.7 Econometrics Estimation Procedures

• Serial Correlation

To achieve accurate estimation in dynamic models, GMM estimators necessitate that the error term (εit) displays no serial correlation (Stata13, 2013). Specifically, if εit lacks serial correlation, then Δεit will be correlated with Δεit-1, as shown by $Cov(\Delta\varepsilon it, \Delta\varepsilon it\text{-}1) = Cov(\varepsilon it - \varepsilon it\text{-}1, \varepsilon it\text{-}1 - \varepsilon it\text{-}2) = -var(\varepsilon it\text{-}1) \neq 0$. In contrast, Δεit will not correlate with Δεit-k for all $k \geq 2$. The Arellano-Bond tests for serial correlation are employed to assess whether Δεit is correlated with Δεit-k for $k \geq 2$ (Roodman, 2006).

Rejecting the null hypothesis of no first-order serial correlation in the first-differenced errors does not automatically suggest that the model is inadequate. However, rejection of the null hypothesis at higher orders could indicate possible problems with the generated moment conditions (Drukker, 2008; Gebreyessus, 2011; Roodman, 2006; Cameron & Trivedi, 2005; Stata13, 2013).

• Over identifying restriction

Dynamic panel data (DPD) models generally involve estimating a limited set of parameters under certain conditions. To assess the validity of over-identifying restrictions, researchers use the traditional GMM test, known as the Sargan Test (Bowsher, 2002). However, this test assumes that error terms are homoscedastic, a condition required for it to follow an asymptotic chi-squared distribution (Stata13, 2013). Bowsher (2002) pointed out that the Sargan test has limited power when used with panels typical in empirical studies and does not provide a test statistic with robust standard errors.

Arellano and Bond (1991) demonstrated that the one-step Sargan test often incorrectly rejects valid instruments in the presence of heteroskedasticity, whereas the two-step test might inadequately address weak instruments. They suggested using an improved version of the system GMM estimators developed by Roodman (2006), which allows for the application of the Hansen (1982) J test for over-identifying restrictions and offers robust standard errors.

• Heteroskedasticity

When estimating dynamic panel data models, the standard GMM. However, it is advisable touse robust standard errors to address potential heteroscedasticity (Cameron & Trivedi, 2005; Drukker, 2008; Stata13, 2013). To detect heteroscedasticity, one can apply the Breusch-Pagan test involves regressing the squared residuals on the explanatory variables, including a constant term. The test statistic is obtained by multiplying N (T-1) by the R^2 from this auxiliary regression, and it follows an asymptotic chi-squared distribution with degrees of freedom equal to the number of regressors (Verbeek, 2004).

• Endogeneity

Endogeneity refers to the correlation between independent variables and unobserved factors in the dependent variable. It occurs when the predictor variable and the error term are related, potentially biasing the regression results (Wooldridge, 2002). In dynamic GMM setups, lagged levels and initial differences of endogenous variables are used as instruments to address endogeneity issues. In this study, the lag of lnExport is treated as an endogenous variable in the dynamic GMM framework.

• **Panel Unit Root Test**

Conducting a unit root test on panel data aims to ascertain whether the variables in the panel are stationary or non-stationary over time. This distinction is crucial because non stationary variables can lead to spurious regression outcomes and erroneous interpretations. Panel unit root testing developed from time series unit root testing, with the main distinction being its consideration of the asymptotic behavior of both the time-series dimension (T) and the cross-sectional dimension (N).

Different tests for unit roots or stationarity in panel datasets can be conducted using software such as Stata. Key tests include the Levin-Lin-Chu (2002), Harris-Tzavalis (1999), Breitung (2000; Breitung and Das 2005), Im-Persaran-Shin (2003), and Fisher-type (2001) tests. These tests generally have the null hypothesis that all panels contain a unit root. Conversely, the Hadri (2000) Lagrange multiplier (LM) test hypothesizes that all panels are (trend) stationary.

CHAPTER FOUR

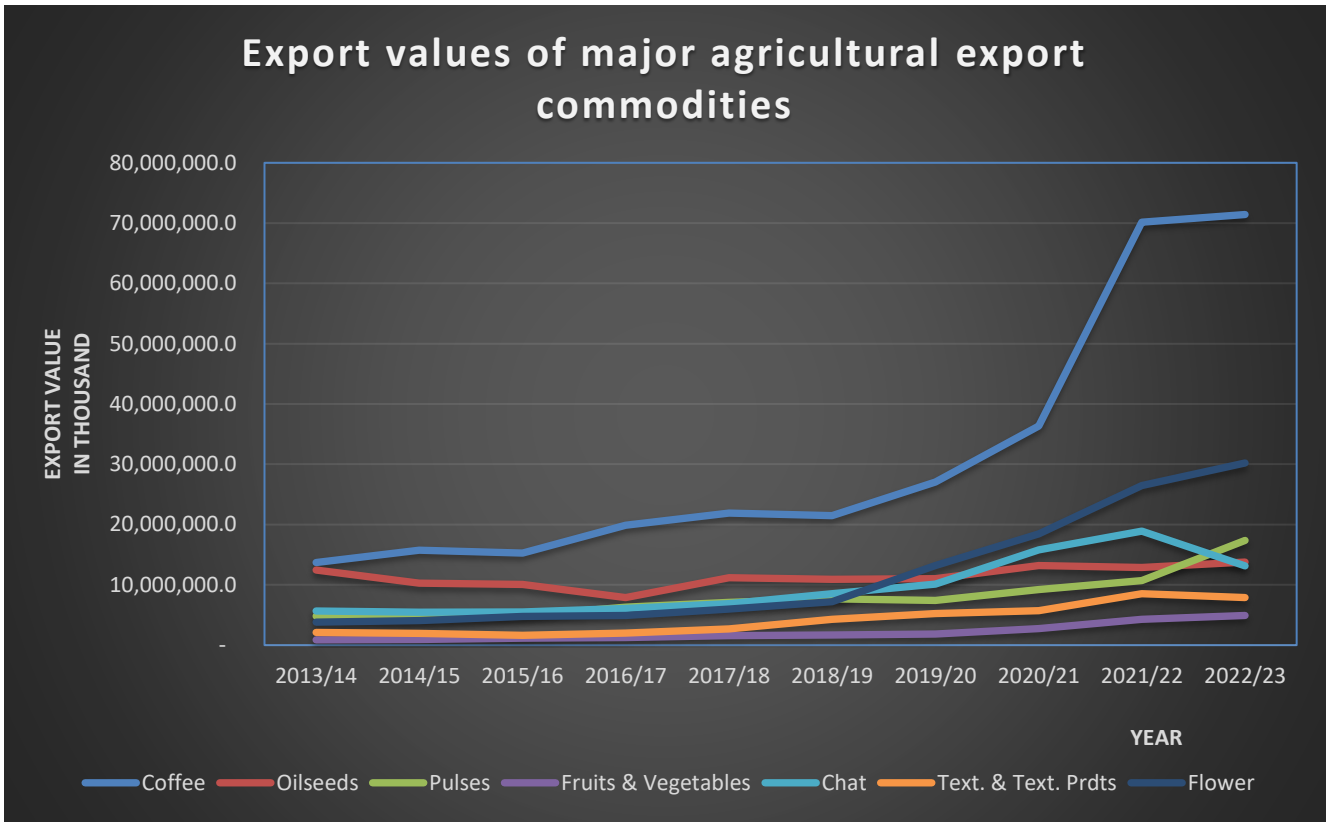
4 RESULT AND DISCUSSION

4.1 Ethiopian Agricultural Export trend and destinations

4.1.1 Export Value Trends of Major Agricultural Export Commodities

Tracking agricultural export trends provides valuable insights into market dynamics, economic opportunities, risk management, policy formulation, and sustainability efforts. This information is essential for farmers, businesses, policymakers, and other stakeholders to make informed decisions and maximize the benefits of agricultural exports.

Fig 4.1 Trends of Export values of major agricultural export commodities



Source: Author's own computation using NBE data 2022/23

As the figure above (fig 4.1) clearly shows, the analysis of Ethiopia's export receipts over the past decade reveals a significant reliance on a handful of primary agricultural commodities. Specifically, coffee, flowers, pulses, oilseeds, and chat have emerged as key contributors to the country's export revenue. In 2022/23, coffee stood out as the top earner, accounting for nearly 45% of the total agricultural export receipts (71.4billion birr), followed by flowers and pulses accounting for19%(30.2Billion birr) and 11% (17.3 billion birr) respectively. These commodities also played a crucial role in bolstering Ethiopia's overall export earnings, with coffee, flowers, and pulses contributing 37.4%, 15.8 %, and 9.1 % of earnings to the country's total export value. Oilseeds and chat had also a valuable contribution to the export receipts of Ethiopia with 13.7 Billion birr and 13.1 Billion birr earnings which are 7.2 % and 6.9 % of the total export value respectively. The data underscores the heavy dependence of Ethiopia's export revenue on a select group of agricultural products, highlighting the need for diversification strategies to mitigate risks associated with such concentrated exports.

Figure 4.2 Trends of total value of export

Source: Author's own computation using NBE data 2022/23

In the past decade, Ethiopia's export sector has shown a mixed trend. While there has been overall growth in export revenue, there have also been fluctuations and challenges. Ethiopia's export revenue has shown a general upward trend over the past decade reaching its peak in 2021/22 with a total export value of nearly 200Billion Birr. However, in the fiscal year 2022/23, the export value of has fallen relative to the past year.

This growth has been driven by primary agricultural commodities such as coffee, oilseeds, flower, pulses, fruit and vegetables and chat, which have historically been the mainstay of the country's export earnings.

This assures that the export sector has remained heavily reliant on a few primary agricultural commodities, particularly coffee, oilseeds, and chat. This dependence poses risks to the country's export earnings, as it makes the economy vulnerable to price fluctuations and other market uncertainties related to these commodities.

In summary, while Ethiopia's export sector has seen overall growth in recent years, foreign earnings from the export of various commodities have experienced declines in some years particularly in 2022/23. Hence, efforts to diversify the export base and address vulnerabilities in the market should be considered.

Table 4.1 Value of Major Agricultural Exports in Thousands Birr from 2019/20-2022/23

t items	2019/20	%	2020/21	%	2021/22	%	2022/23	%
e	27,044,310.5	28.7	36,367,828.0	25.7	70,175,272.0	35.1	71,425,122.0	37.4
ds	11,012,982.9	11.7	13,180,233.0	9.3	12,896,678.4	6.4	13,781,966.4	7.2
er & Leather ts	2,208,391.3	2.3	1,425,336.1	1.0	1,609,850.6	0.8	1,315,467.5	0.7
	7,422,895.7	7.9	9,243,279.1	6.5	10,711,389.3	5.4	17,370,062.4	9.1

Products	2,107,034.0	2.2	2,964,430.2	2.1	5,329,508.5	2.7	4,345,071.3	2.3
& Vegetable	1,834,795.4	1.9	2,730,982.1	1.9	4,272,817.6	2.1	4,921,869.7	2.6
	6,572,639.3	7.0	25,378,419.0	17.9	26,464,048.5	13.2	10,491,436.8	5.5
Animals	1,671,076.6	1.8	1,758,839.4	1.2	1,437,406.1	0.7	931,096.6	0.5
	10,116,170.9	10.7	15,808,881.6	11.2	18,910,324.2	9.5	13,154,557.3	6.9
Textile ts	5,235,336.0	0.6	5,725,100.5	4.0	8,529,908.7	4.3	7,911,617.6	4.1
r	13,208,479.3	14.0	18,461,631.4	13.0	26,445,082.3	13.2	30,210,536.2	15.8
contribution l export	**88,434,111.9**	**88.7%**	**133,044,960.4**	**93.9%**	**186,782,286.2**	**93.4%**	**175,858,803.8**	**92%**
export	**94,356,919.6**		**141,701,409.6**		**199,995,039.00**		**191,157,332**	

Source: Author's own computation using NBE data 2022/23

As clearly shown in table 4.1, Ethiopia has experienced significant growth in export revenue past few years. For instance, the value of exports rose from roughly 94.35 billion birr in 2019/20 to 141.7 billion birr in 2020/21, and then from 141.7 billion birr to 199.99 billion birr in 2021/22, representing increases of roughly 50.18% and 41.14% respectively from the previous year. However, in the fiscal year 2022/23, there was a slight decrease of 4.42% in export value.

Despite this overall growth, the majority of Ethiopia's export earnings are derived from agricultural products, including coffee, oilseeds, flowers, fruits, vegetables, pulses, and chat. These agricultural exports consistently contribute a significant portion to the nation's total export value, ranging from 76% to 86.5% over the past few years.

In this context, coffee has a significant and leading impact on Ethiopia's export revenue, accounting for 28.7% of the total in 2019/20, followed by flowers (14%) and oilseeds (11.7%). Similarly, in 2020/21, coffee export earnings constituted 25.7%, surpassing gold (17.9%), flowers (13%), and oilseeds (9.3%). Furthermore, over 35% of Ethiopia's export earnings came from coffee exports, while gold and flower exports contributed nearly the same amount (13.2%), and chat (9.5%) to the overall export value. Likewise, in 2022/23, coffee's contribution to the country's export earnings exceeded 37%, followed by flowers (15.8%), pulses (9.1%), oilseeds (7.2%), and chat (6.9%).

Generally, Ethiopia's export revenue relies heavily on a small number of key agricultural products, particularly coffee, flowers, oilseeds, and chat in recent years. Although gold exports also make a significant contribution to the country's foreign earnings, it should not be overlooked.

Upon reviewing the data presented in Table 4.2, it is evident that the export values of Ethiopia's major commodities experienced notable growth in the years 2020/21 and 2021/22. However, there was a decline of 35.5% in the export value of leather and leather products compared to the previous year, with both oilseeds and live animals showing decreases of 2.2% and 18.3% respectively in 2021/22. Additionally, in the fiscal year 2022/23, most commodity export values decreased from the previous year, except for certain goods such as pulses, fruit and vegetables, flowers, oilseeds, and coffee, which saw increases of 62.2%, 15.2%, 14.2%, 6.9%, and 1.8% respectively. These fluctuations can be attributed to shifts in global demand for Ethiopian products, changes in commodity prices, domestic production capacity, political instability, and illegal smuggling of commodities.

Table 4.2 Percentage change of Export value of Ethiopia's major export

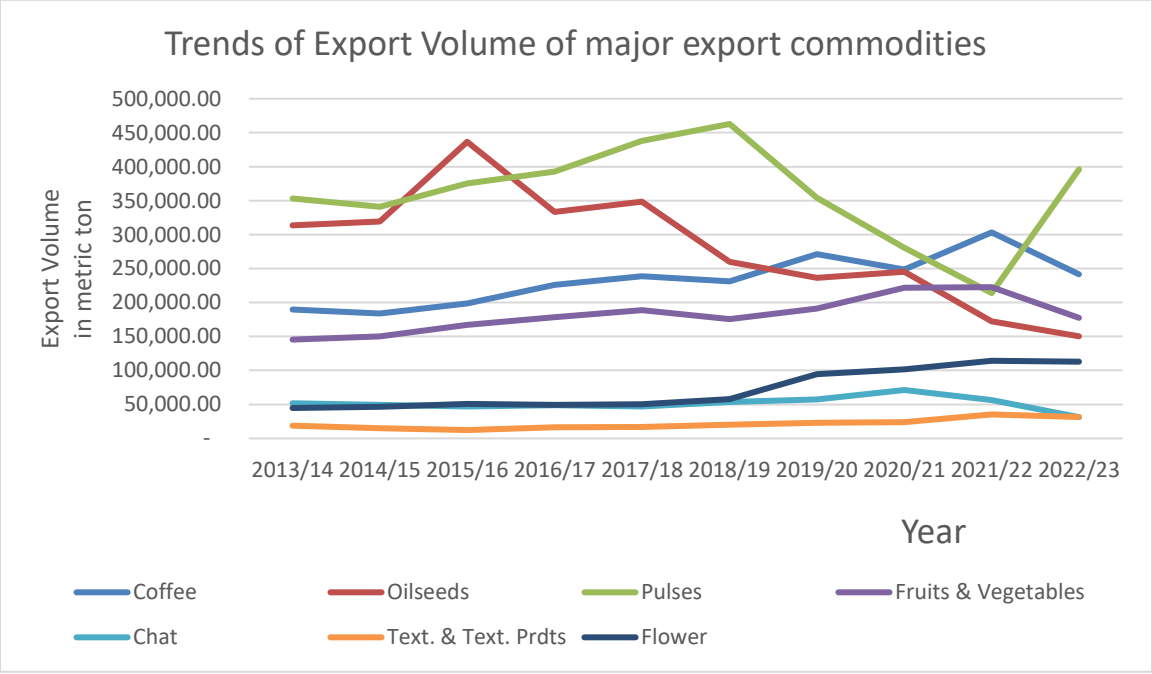
Export value of Ethiopia's major export (% change)			
Export items	**2020/21**	**2021/22**	**2022/23**
Coffee	34.5	93	1.8
oilseeds	19.7	(2.2)	6.9
Leather and Leather products	(35.5)	12.9	(18.3)
Pulses	24.5	15.9	62.2

Meat Products	40.7	79.8	(18.5)
Fruits & Vegetables	48.8	56.5	15.2
Gold	286.1	4.3	(60.4)
Live Animals	5.3	(18.3)	(35.2)
Chat	56.3	19.6	(30.4)
Text. & Text. Products	9.4	49	(7.3)
Flower	39.8	43.2	14.2
Total Export	**50.18**	**41.14**	**(4.42)**

Source: Author's own computation using NBE data 2022/23

4.1.2 Export volume trend of major agricultural export commodities

Figure 4.3 Volume of Major Agricultural export commodities (in metric ton)

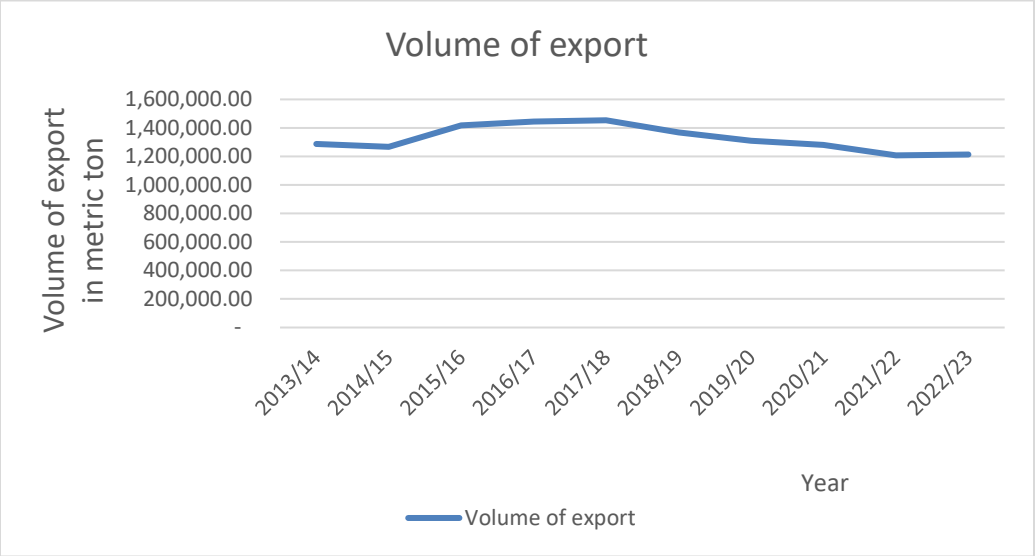


Source: Author's own computation using NBE data 2022/23

Over the past decade, Ethiopia witnessed substantial growth in the export volume of its major agricultural commodities. However, starting from 2017/18, there has been a noticeable decline in export volumes. For instance, in 2018/19, the export volume of oilseeds decreased by 25.4%, while coffee experienced a 3.2% decline compared to the previous year. Additionally, the export volume of fruit and vegetables dropped by 7.7%

in the same fiscal year. In 2019/20, the trend continued with oilseeds and pulses seeing a decline of 9.04% and 23.51% respectively, while coffee and fruit and vegetable exports rose by 17.4% and 8.86%. This fluctuation indicates a mixed trend in Ethiopia's export volume over recent years.

Figure 4.4 Trends of total Volume of export



Source: Author's own computation using NBE data 2022/23

As the figure above (fig 4.4) illustrates, Ethiopia has experienced significant growth in total volume of export in the early years of the past decade. However, since 2017/18, the volume of export showed a slight decline. In spite of the growth volume of export overall, the country's export volume is heavily reliant on primary agricultural commodities such as coffee, pulses, fruits, vegetables, oilseeds, flowers, and chat.

4.2 Contribution of Agricultural Export to the Ethiopian Economy

International trade often overcomes the constraints of domestic market, leading to market expansion by improving labor distribution and productivity. This market growth boosts global production, which in turn generates internal and external economies of scale and increases a nation's income.

According to Afonso (2001), these factors make international trade a crucial dynamic force that enhances worker skills, fosters technical innovation, promotes capital accumulation, and addresses technical indivisibilities, thereby potentially driving economic growth in participating countries. The influence of exports

on economic development is viewed as a significant policy issue in many developing economies (Gilbert, Linyong, and Divine, 2013).

Growth in real exports often leads to an increase in real gross national product for several reasons. Exports generate foreign exchange that can be used to acquire essential manufactured goods, capital goods, and technology. Additionally, the competitive pressure from foreign markets encourages technological advancement, economies of scale, and improved management practices, which indirectly foster economic growth. Ultimately, exports directly enhance productivity by optimizing resource allocation based on comparative advantage and specialization (Wang, M. 2009).

Agriculture typically constitutes a significant portion of total exports in developing economies. It is surprising that empirical research on the impact of agricultural exports on economic growth has been relatively overlooked in the literature, despite its well-established role in development. In recent decades, agricultural exports have been crucial to the economic growth of many developing countries. They remain the primary source of foreign exchange for most countries in Sub-Saharan Africa (Gilbert, 2009).

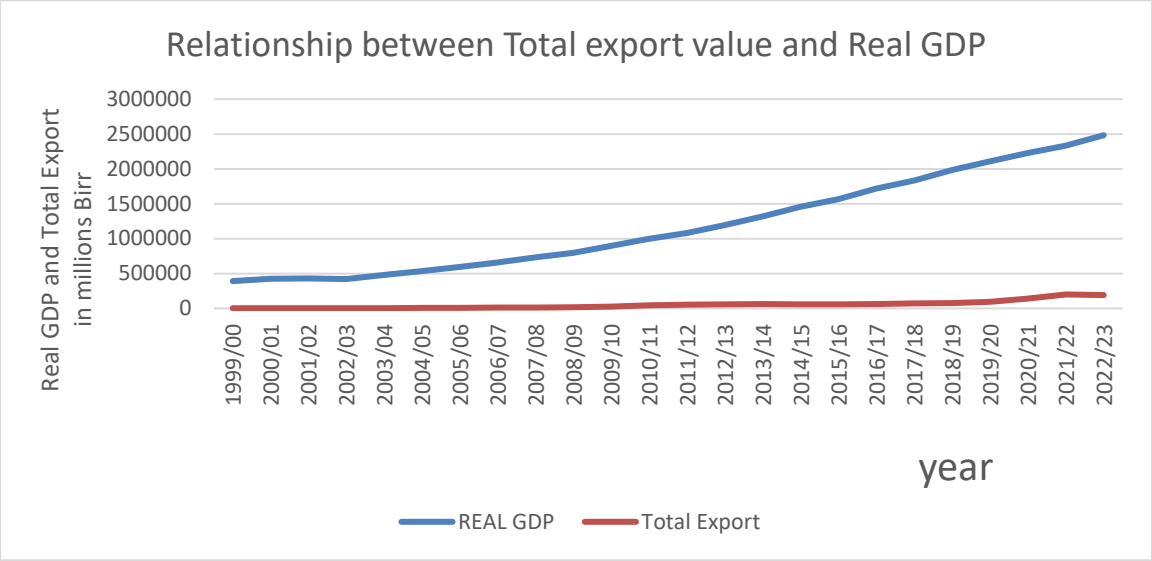
Agricultural exports play a significant role in Ethiopia's economy. The country is known for its production and export of various agricultural products, including coffee, oilseeds, pulses, flowers, and vegetables. These exports generate foreign exchange earnings and create employment opportunities, especially in rural areas where agriculture is the main source of income.

Ethiopia's coffee industry, in particular, is a major contributor to its economy, with the country being one of the top coffee producers in the world. Coffee exports generate substantial revenue for the country and support the livelihoods of millions of smallholder farmers. Additionally, the export of oilseeds and pulses also contributes significantly to Ethiopia's economy. These products are in high demand internationally and provide valuable income for the country. Furthermore, the export of flowers and vegetables has been growing in recent years, creating employment opportunities and generating foreign exchange earnings.

Overall, agricultural exports play a crucial role in Ethiopia's economy by providing income, employment, and foreign exchange earnings, contributing to the country's economic development and growth.

For instance, according to the data provided, Ethiopia's agricultural exports have consistently accounted for a significant portion of the country's total exports, with percentages of 81.7%, 76%, 80.2%, and 86.5% in the years 2019/20, 2020/21, 2021/22, and 2022/23 respectively. This highlights that the majority of Ethiopia's foreign income is generated through the export of primary agricultural products such as coffee, oilseeds, vegetables, pulses, flowers, and chat. These export earnings play a crucial role in driving the country's real GDP growth, as demonstrated in the figure below (Fig 4.5), and contribute positively to Ethiopia's overall development.

Figure 4.5 Relationship between export value and economic growth



Source: Author's own computation using NBE data 2022/23

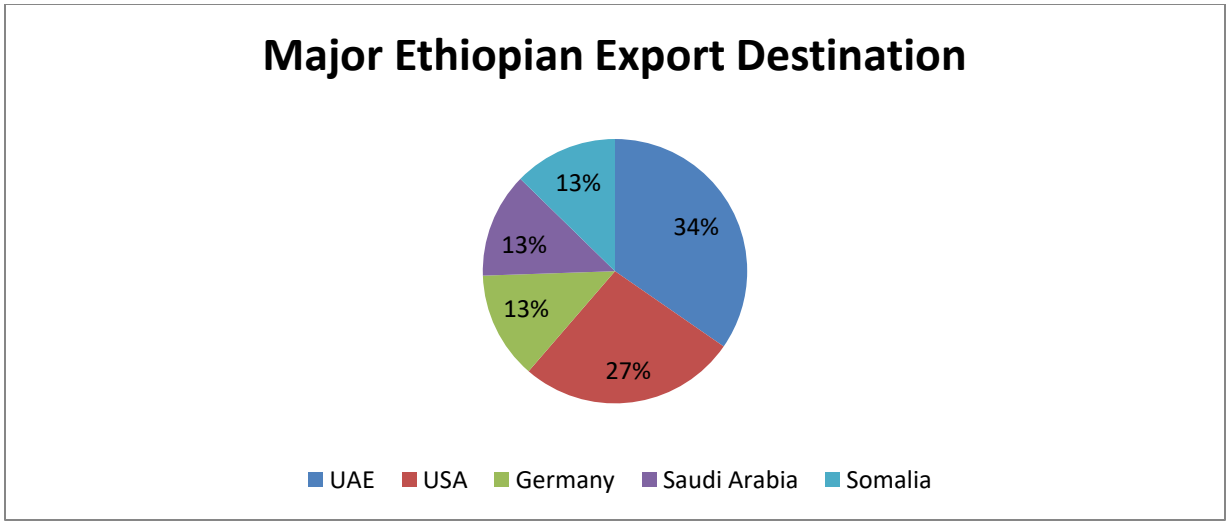
4.3 Direction of Ethiopia's Export

In terms of Ethiopia's trade distribution, the primary destinations for its agricultural exports in 2019/20 were Asia, Europe, and Africa. Europe accounted for 41% of Ethiopia's total export goods. Within Europe, Switzerland was the largest market, making up 45.4% of total export earnings, followed by the Netherlands (9.7%), Germany (8.9%), Belgium (6.1%), Italy (3.2%), the United Kingdom (2.2%), France (1.9%), Turkey (1.5%), and Spain (1%). Together, these countries represented 89.9% of Ethiopia's total exports to Europe in 2019/20.

Asia represented 31% of Ethiopia's total export goods, with Saudi Arabia receiving 18.7%, followed by the United Arab Emirates (14.7%), India (6.7%), Japan (6.6%), South Korea (6.1%), China (6%), Israel (6%), Singapore (4.5%), Indonesia (2.8%), Yemen (2.8%), and Taiwan (1.7%). Collectively, these countries accounted for 76.6% of Ethiopia's total exports to Asia.

In 2022/23, Ethiopia exported goods worth $4.24 billion, making it the 134th largest exporter worldwide. Over the past five years, Ethiopia's exports have grown by $1.17 billion, increasing from $3.07 billion in 2017 to $4.24 billion in 2022/23. The main export destinations for Ethiopia include the United Arab Emirates ($723 million), the United States ($557 million), Germany ($274 million), Saudi Arabia ($268 million), and Somalia ($265 million). The country's export revenues are predominantly from coffee ($1.55 billion), gold ($546 million), flowers ($255 million), other vegetables ($235 million), and other oily seeds ($212 million), underscoring Ethiopia's strong position in agricultural exports.

Figure 4.6 Major Ethiopian commodity export destinations



Source: Author's own computation using World Bank data 2022/23

4.4 Econometrics Model Results

4.4.1 Summary of Descriptive Statistics Results

Before engaging any regression analysis, it is fundamental to establish the descriptive statistics. This is because including a summary of descriptive statistics results in regression analysis is essential for understanding the data, checking assumptions, identifying outliers, comparing variables, and effectively communicating the key characteristics of the data set. The table below (Table 4.3) presents the descriptive statistics for the variables in logarithmic form, along with the correlation matrix. In the study, samples of three major Ethiopian agricultural export commodities for the period 1999/2000- 2022/23 were used.

Table 4.3 Descriptive Statistics of the study variables

Variables	Obs	Mean	Std. Dev.	Min	Max
lnExport	**72**	**14.665**	**1.839**	**10.698**	**18.084**
lnFDI	**72**	**9.455**	**2.385**	**4.635**	**12.132**
lnTOP	**72**	**3.579**	**0.563**	**2.412**	**4.309**
lnExR	**72**	**2.772**	**0.602**	**2.097**	**4.019**
lnIT	**72**	**10.543**	**1.494**	**8.195**	**13.293**
lnCPI	**72**	**4.05**	**0.987**	**2.688**	**5.938**

Source Author's own computation using STATA 17

The means provide good measures of central tendency for the variables in the dataset. Here are the summarized average values, minimum and maximum values, and standard deviations for each variable:

- lnExport: Average value of 14.665 Billion birr, ranging from 10.698 to 18.084 Billion birr, with a standard deviation of 1.839.

- lnFDI: Mean value of 9.455 Billion birr, with values ranging from 4.635 to 12.132 Billion birr, and a standard deviation of 2.385.
- lnTOP: Average value of 3.579, with minimum and maximum values of 2.412 and 4.309, and a standard deviation of 0.563.
- lnExR: Mean value of 2.772, ranging from 2.097 to 4.019, with a standard deviation of 0.602.
- lnIT: Minimum value of 8.195 Billion birr, maximum value of 13.293 Billion birr, and an average of 10.543 Billion birr, with a standard deviation of 1.494.
- lnCPI: Minimum value of 2.688, maximum value of 5.938, and an average of 4.05, with a standard deviation of 0.987.

Overall, these statistics imply that the variables in the dataset are centered on the average, with some variation in values both below and above this average. The standard deviation indicates that the export values are relatively consistent and not widely spread out from the mean.

4.4.2 Panel unit root test

While the unit root test is typically associated with time series data, assessing stationarity in panel data sets can provide greater efficiency and benefits compared to traditional time series tests for stationarity. Dealing with non-stationary data in empirical research is often considered as a significant hurdle, as it can result in inaccurate findings that are not suitable for subsequent analysis.

In this study, the Levin–Lin–Chu (2002), Harris–Tzavalis (1999), Breitung (2000) and Breitung and Das (2005) tests were employed.

Table 4.4 Testing for Panel Unit Roots

Ho: panel data has unit root(not stationary) Ha: panel data has not unit root (stationary)			
Variables	Adjusted t statistics	P value	Test for unit root in level
lnExport	-3.3114	0.0005	I(1)
lnFDI	-3.6396	0.0001	I(0)
lnCPI	-3.4409	0.0003	I(1)
lnTOP	-2.3262	0.010	I(0)
lnIT	-1.6569	0.0488	I(1)
lnExR	-3.0829	0.0010	I(1)

Source Author's own computation using STATA 17

According to the above table result, we fail to accept the null hypothesis implying that the variables are almost all stationary. While lnFDI and lnTOP were stationary at level, lnExport, lnIT, lnCPI and lnExR were stationery at first difference.

4.4.3 Estimation Results

Equations from chapter three of the model specification procedure are estimated using Generalized Method of Moments (GMM). For comparison purposes, the researcher opted to employ the one-step system GMM approach. In choosing the appropriate model, the researcher checked pooled OLS, dynamic difference GMM and fixed effect regression. The following table put it clearly that system GMM is the preferred model in this panel. This is because the estimated coefficient of lagged export value of dynamic difference GMM

($\tilde{\alpha}_D$_GMM=0.655) is less than that of fixed effect coefficient ($\tilde{\alpha}_{FE}$ =0.66) meaning difference GMM has a downward bias due to weak instrumentation.

Table 4.5 Choose between Difference GMM and System GMM

Description	**Coeff. (value of $\tilde{\alpha}$)**
Pooled OLS $\tilde{\alpha}_{OLS}$	**0.965****
Fixed-effects (within) regression $\tilde{\alpha}_{FE}$	**0.66****
Dynamic panel-data estimation, one-step difference GMM, $\tilde{\alpha}_{D\_GMM}$	**0.655****

Depending on the above analysis, the results shown in the below table (table 4.6) were estimated using a one-step system GMM dynamic estimation. The results of the estimation show that all of the independent variables including the lag value of the dependent variable, which is endogenous, are significant. Additionally, the explanatory variables have the expected sign or effect on the dependent variables.

To put it clearly, the estimated coefficient of foreign direct investment (lnFDI) is 0.136. This shows that an increase in foreign direct investment by 1% results an increase in export value by 0.136%, on average, citrus paribus. The positive relationship between foreign direct investment (FDI) and exports can be attributed to several factors: FDI can lead to the transfer of technology and knowledge from the investing company to Ethiopia. Besides, FDI can enable the country to achieve economies of scale by expanding their production capacity in the country making exports more competitive in international markets. It can also stimulate the development of local production, which can then become part of the global value chain.

The table below also shows that trade openness has a significant and positive effect on Ethiopia's agricultural export value having an estimated coefficient of 0.301. This states that, on average, a rise in trade openness by 1%, leads to a rise in total export value by 0.301 keeping other things constant. This is due to the fact that Trade openness can attract foreign direct investment, which can lead to technology transfer, knowledge spillovers, and enhanced production capabilities of agricultural sector that support export growth. It also allows Ethiopia to access inputs, raw materials, and resources from other countries at competitive prices to boost its agricultural export commodities. Furthermore, trade openness allows Ethiopia to access foreign markets more easily.

In addition to foreign direct investment and trade openness, the regression result also indicates the existence of positive and significant relationship between exchange rate and export value of selected agricultural commodities (coffee, oilseeds and fruits and vegetables). This is so true because when the country's currency devaluates (decrease in value relative to other currencies), price of local products will be cheaper, making export cheaper. So, in this case, Ethiopia's currency devaluation has significant effect on its agricultural export values.

While foreign direct investment (FDI), trade openness (TOP) and exchange rate (ExR) have positive effect, indirect tax (IT) and consumer price index (CPI) have negative but significant effect on Ethiopia's agricultural

value of export. Indirect tax, for instance, has an estimated coefficient of (-0.408) illustrating that an increase in indirect tax by 1% is associated to a decrease export value by 0.408% on average, citrus paribus. High indirect taxes raise production costs, making higher price of exported goods, which leads to reduces demand in foreign markets.

Similarly, consumer price index (CPI) has a negative but significant effect on Ethiopia's agricultural value of export. As the table below shows the estimated coefficient of lnCPI is (-0.551) meaning that an increase in consumer price index by 1% is associated to a decrease export value by 0.551% on average, keeping other things constant.

More importantly, lag of the dependent variable has also a significant and positive effect on the export value of Ethiopia with high coefficient (0.965). This high coefficient value shows the existence of strong persistence between export value and its past. It also means that history really matters when we come to Ethiopia's export.

Generally, the independent variables used in the study have a significance effect on Ethiopia's agricultural export value (significant at 5% except for CPI, which is significant at 10% level of significance).

Table 4.6 Regression result of independent variables

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
lnExport L	0.965***	0.022	43.31	0	0.921	1.009
lnFDI	0.136***	0.051	2.66	0.008	0.036	0.237
lnTOP	0.301***	0.11	2.73	0.006	0.085	0.516
lnExR	1.266***	0.388	3.26	0.001	0.506	2.026
lnIT	-0.408**	0.179	-2.28	0.022	-0.758	-0.058
lnCPI	-0.551*	0.329	-1.67	0.094	-1.196	0.094
Constant	1.347	0.833	1.62	0.106	-0.287	2.98

Note: *, **and *** represent significances at a 10%, 5% and 1% respectively

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Arellano-Bond test for AR(1) in first differences: z = -7.55 Pr > z = 0.000
Arellano-Bond test for AR(2) in first differences: z = 0.32 Pr > z = **0.750**

Sargan test of overid. restrictions: chi2(61) = 59.27 Prob > chi2 = 0.539

Difference-in-Sargan tests of exogeneity of instrument subsets:

GMM instruments for levels

Sargan test excluding group: chi2(58) = 48.54 Prob > chi2 = **0.807**

Difference (null H = exogenous): chi2(3) = 10.72 Prob > chi2 = **0.13**

iv(lnFDI lnTOP lnExR lnIT lnCPI)

Sargan test excluding group: chi2(58) = 58.21 Prob > chi2 = **0.468**

Difference (null H = exogenous): chi2(3) = 1.06 Prob > chi2 = **0.787**

Mean dependent var	14.755	SD dependent var	1.795
Number of obs	69	Chi-square	267131.515

After computing estimation of the coefficient of the independent variables, the estimated equation for the study is given by:

$$\boldsymbol{lnExportit = 1.347 + 0.965lnExport(it-1) - 0.551lnCPI - 0.408lnITit + 1.266lnExRit + 0.301lnTOPit + 0.136lnFDIit + Uit} \ldots\ldots\ldots (\mathbf{3.8})$$

Where,

lnExportit is ln of export value

lnExportit-1 is lag of ln export value,

lnCPI is ln of consumer price index,

lnExR is ln of exchange rate,

lnTOP is ln of trade openness,

lnFDI is ln of foreign direct investment and

ui is the error term.

4.4.4 GMM Diagnostics Test

To assess the validity of the instruments, the Sargan test of over-identification restrictions is used. The null hypothesis (H0) is that the instruments are valid, meaning they are uncorrelated with the error term, while the alternative hypothesis is that at least one of the over-identifying restrictions is invalid. In this model, the p-value is 0.539, suggesting that we fail to reject the null hypothesis. Consequently, the instruments used in the model are considered valid. Moreover, Arellano-Bond test for serial correlation was employed. AR (2) has a p value of (Pr > z = 0.750), which makes the researcher not to reject the null hypothesis (H0) of autocorrelation doesn't exist.

Difference-in-Sargan tests of exogeneity of instrument having a null hypothesis that instruments are exogenous were also used. In this case the p values were found to be insignificant (0.807, 0.13, 0.468 and 0.787) indicating no problem of endogineity.

Finally, the F test/Wald test has a p-value of 0.000 showing the joint significance of the explanatory variables.

CHAPTER FIVE

5 CONCLUSION AND POLICY IMPLICATIONS

5.1 Conclusion

Agriculture is the cornerstone of Ethiopia's economy, contributing 45 percent of the Gross Domestic Product (GDP) and employing 85 percent of labor force. Agricultural exports account for 86 percent of the country's total foreign exchange earnings. To boost and diversify the export sector's contribution to economic growth, Ethiopia has implemented various measures, including export trade duty incentives, export credit guarantees, and foreign exchange retention schemes for exporters. Despite these incentives, the export sector remains heavily reliant on a few agricultural products --primarily coffee, oil seeds, fruits and vegetables, pulses, and flowers—which are often subject to fluctuations in quantity and price as well as challenges of global competitiveness.

Therefore, this paper assessed the major determining factors of Ethiopian agricultural commodity export. In doing so, the researcher used a panel data of three major agricultural exports for a period of twenty-three years covering from 1990/20 to 2022/23. The paper also used a one-step system GMM model to estimate the parameters. Following this, the researcher estimated the coefficients of foreign direct investment(FDI), indirect tax(IT), consumer price index(CPI), exchange rate (ExR) and trade openness(TOP) as well as the coefficient of lagged agricultural export value.

The estimation of coefficient of lag of export value was to investigate whether past history of the dependent variable (ln Export) influence current values. The regression result shows that there is a statistically significant and positive effect of past value of agricultural commodities on current export values. In this regard, the paper concluded that history really matters when we come to export value of agricultural export.

The finding shows that foreign direct investment and export value are positively related in Ethiopia. This indicates that Ethiopia is getting transfer of technology and knowledge from the investing company. Besides, FDI enabled the country to achieve to expand agricultural production capacity in the country making exports more competitive in international markets.

According to the study, trade openness also plays a significant role in enhancing Ethiopia's agricultural export revenue. From this the researcher concluded that Ethiopia attracted foreign direct investment, which can lead to technology transfer, knowledge spillovers, and enhanced production capabilities of agricultural export through being open to the world.

It also allows Ethiopia to access inputs, raw materials, and resources from other countries at competitive prices to boost its agricultural export commodities. Moreover, trade openness helps Ethiopia to access foreign markets in the study period.

In addition to foreign direct investment and trade openness, the regression result also indicates the existence of positive and significant relationship between exchange rate and export value of selected agricultural commodities (coffee, oilseeds and fruits and vegetables). This is so true because when the country's currency devaluates (decrease in value relative to other currencies), price of local products will be cheaper, making export cheaper. So, in this case, the paper concluded that Ethiopia's currency devaluation has significant effect on its agricultural export values.

While foreign direct investment (FDI), trade openness (TOP) and exchange rate (ExR) have positive and significant effect, indirect tax (IT) and consumer price index (CPI) have negative and significant effect on Ethiopia's agricultural value of export. Depending on this, the researcher can conclude that the existence of higher indirect tax and higher inflation in Ethiopia hinders its agricultural export earnings in particular and its economic growth in general.

Generally, the independent variables used in the study (foreign direct investment (FDI), trade openness (TOP), exchange rate (ExR), indirect tax (IT) and consumer price index (CPI)) have statistically significant effect on Ethiopia's agricultural export. While foreign direct investment (FDI), trade openness (TOP) and exchange rate (ExR) have positive and significant effect, indirect tax (IT) and consumer price index (CPI) have negative and significant effect on Ethiopia's agricultural value of export.

5.2 Policy Implications

In the past decade, Ethiopia's agricultural export has overall shown an upward trend in terms of value of export. However, the earning from export is earned from export of few major agricultural commodities like coffee, oilseeds, vegetables, pulses and flower. Depending on the results, the researcher recommends the following:

- In the study it is found that indirect tax has a significant adverse effect on Ethiopia's agricultural commodity export value in particular and the country's total export at large. Therefore, the Ethiopian government ought to provide tax breaks or exemptions specifically for agricultural exporters to reduce the burden of indirect taxes on their operations.
- The National Bank of Ethiopia should take steps to manage inflation by using suitable monetary policy tools, such as adjusting interest rates and setting reserve requirements. Additionally, it should work to maintain price stability for agricultural inputs and outputs through efficient market regulation and oversight.
- The National Bank should also implement a managed devaluation strategy to ensure stability and minimize adverse effects on domestic prices and inflation. Additionally, provide support for exporters to mitigate potential risks associated with currency fluctuations, such as currency hedging mechanisms and export financing assistance.

- Although trade openness has a significant positive effect on agricultural export value, the Ethiopian government should work more to foster a conducive environment for trade openness by reducing trade barriers, streamlining customs procedures, and negotiating favorable trade agreements.

- The concerned body of Ethiopian government should offer tax incentives, investment guarantees, and preferential treatment for foreign investors in the agricultural sector so as to attract more FDI towards the agricultural sector.

- The government should also promote technology transfer and knowledge sharing between foreign investors and local agricultural producers to improve productivity and enhance the quality of agricultural exports.
- Furthermore, the government of Ethiopia ought to Invest in infrastructure such as irrigation systems, roads, and ports to support agricultural production and facilitate the export of agricultural products.
- Finally, the government of Ethiopia ought to subsidize agricultural inputs such as seeds, fertilizers, and equipment to lower production costs and enhance export competitiveness.

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APPENDEX

Pooled OLS

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
lnExport L	**.965****	.022	44.14	0	.921	1.009	***
lnFDI	.136	.05	2.72	.009	.036	.237	***
lnTOP	.301	.108	2.78	.007	.085	.516	***
lnExR	1.266	.381	3.33	.001	.505	2.026	***
lnIT	-.408	.175	-2.33	.023	-.759	-.058	**
lnINF	-.551	.323	-1.71	.093	-1.196	.094	*
Constant	1.347	.818	1.65	.105	-.288	2.981	

Mean dependent var	14.755	SD dependent var	1.795
R-squared	0.984	Number of obs	69
F-test	654.328	Prob > F	0.000
Akaike crit. (AIC)	2.198	Bayesian crit. (BIC)	17.837

Fixed-effects (within) regression

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
lnExport L	**.66****	.085	7.79	0	.49	.83	***
lnTOP	.336	.099	3.37	.001	.137	.535	***
lnFDI	.144	.046	3.12	.003	.052	.236	***
lnExR	1.193	.35	3.41	.001	.494	1.892	***
lnIT	-.128	.178	-0.72	.473	-.484	.227	
lnCPI	-.557	.296	-1.88	.065	-1.149	.035	*

Constant	2.842	.852	3.34	.001	1.138	4.546	***

Mean dependent var	14.755	SD dependent var	1.795
R-squared	0.976	Number of obs	69
F-test	401.928	Prob > F	0.000
Akaike crit. (AIC)	-11.998	Bayesian crit. (BIC)	3.640

Dynamic panel-data estimation, one-step difference GMM

Regression results

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
lnExport L	**.655****	.074	8.89	.003	.42	.889	***
lnFDI	.144	.034	4.30	.023	.038	.251	**
lnTOP	.336	.039	8.68	.003	.213	.46	***
lnExR	1.192	.635	1.88	.157	-.828	3.211	
lnIT	-.124	.157	-0.79	.489	-.624	.377	
lnCPI	-.557	.413	-1.35	.27	-1.873	.758	

Mean dependent var	14.858	SD dependent var	1.740
Number of obs	66	F-test	.

*** p<.01, ** p<.05, * p<.1*

Dynamic panel-data estimation, one-step system GMM

	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]
lnExport L	0.965	0.022	43.31	0	0.921	1.009
lnFDI	0.136	0.051	2.66	0.008	0.036	0.237
lnTOP	0.301	0.11	2.73	0.006	0.085	0.516
lnExR	1.266	0.388	3.26	0.001	0.506	2.026
lnIT	-0.408	0.179	-2.28	0.022	-0.758	-0.058
lnCPI	-0.551	0.329	-1.67	0.094	-1.196	0.094
Constant	1.347	0.833	1.62	0.106	-0.287	2.98

Mean dependent var	14.755	SD dependent var	1.795
Number of obs	69	Chi-square	267131.515

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Year	72	2011.5	6.971	2000	2023
Export	72	7854923.7	12973592	44249.591	71425122
CPI	72	91.429	92.603	14.7	379
TOP	72	41.021	19.09	11.153	74.358
IT	72	94385.747	128043.95	3622.596	593232.07
FDI	72	53153.946	61616.425	103	185742.6
ExR	72	19.329	13.018	8.143	55.65
commodityID	72	2	.822	1	3
lnExport	72	14.665	1.839	10.698	18.084
lnFDI	72	9.455	2.385	4.635	12.132
lnTOP	72	3.579	.563	2.412	4.309
lnExR	72	2.772	.602	2.097	4.019
lnIT	72	10.543	1.494	8.195	13.293
lnCPI	72	4.05	.987	2.688	5.938