



**ST. MARY'S UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

**ANALYSIS OF THE ETHIOPIAN AGRICULTURAL EXPORT  
PERFORMANCE: A DYNAMIC PANEL DATA ANALYSIS**

**NASREEN MOHAMMED ADEM**

**JULY, 2022  
ADDIS ABABA, ETHIOPIA**



**ST. MARY'S UNIVERSITY  
SCHOOL OF POST GRADUATE STUDIES  
INSTITUTE OF AGRICULTURE AND DEVELOPMENT STUDIES**

# **ANALYSIS OF THE ETHIOPIAN AGRICULTURAL EXPORT PERFORMANCE: A DYNAMIC PANEL DATA ANALYSIS**

A Thesis Submitted to Institute of Agriculture and Development Studies, School Of Graduate Studies, St. Mary's University in Partial Fulfillment of the Requirement for the Degree of Master of Art in Development Management

**By**

**NASREEN MOHAMMED ADEM**

**ADVISOR: SISAY DEBEBE (PhD)**

**JULY, 2022**

**ADDIS ABABA, ETHIPIA**

## **APPROVED BY BOARD OF EXAMINERS**

As members of the board of examiners, we approve that this thesis prepared by Nasreen Mohammed Adem under the title Analysis of the Ethiopian Agricultural Export Performance: A Dynamic Panel Data Analysis, has passed through the defense and review process of the thesis requirement for the Degree of Masters of Art in Development Management.

**Dr TILAHUN TEFERA (PhD)**

Dean Graduate Studies

\_\_\_\_\_

Signature

\_\_\_\_\_

Date

**SISAY DEBEBE (PhD)**

Advisor

\_\_\_\_\_

Signature

\_\_\_\_\_

Date

**BENEBERU ASSEFA (PhD)**

Internal Examiner

\_\_\_\_\_

Signature

\_\_\_\_\_

Date

**GIRMA TESHOME (PhD)**

External Examiner

\_\_\_\_\_

Signature

\_\_\_\_\_

Date

## DECLARATION

I, Nasreen Mohammed Adem, hereby declare that the work in this research study entitled: Analysis of the Ethiopian Agricultural Export Performance: A Dynamic Panel Data Analysis, is my original work prepared under the guidance of Sisay Debebe (PhD). All sources of materials used for this paper have been duly acknowledged and this thesis is not presented by me or any other party for any other purpose.

**Name:** Nasreen Mohammed Adem

**Signature:** \_\_\_\_\_

**Date:** \_\_\_\_\_

## **ENDORSEMENT**

This thesis has been submitted to ST. MARY'S UNIVERSITY SCHOOL OF GRADUATE STUDIES INSTITUTE OF AGRICULTURE AND DEVELOPMENT STUDIES for examination with my approval as a university advisor.

**SISAY DEBEBE (PhD)**

Advisor

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Date

**SAINT MARY'S UNIVERSITY  
ADDIS ABABA, ETHIOPIA**

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## **ACRONYMS AND ABBREVIATIONS**

DPD	Dynamic Panel Data
EPRDF	Ethiopian People Republic Democratic Front
ERCA	Ethiopian Revenues and Customs Authority
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
IFPRI	International Food Policy Research Institute
IMF	International Monetary Fund
LDCs	Least Developing Countries
MoFEC	Ministry of Finance and Economic Corporation
NBE	National Bank of Ethiopia
REER	Real Effective Exchange Rate
UN	United Nations
UNCTAD	United Nation Conference on Trade and Development
USD	United States' Dollar
WTO	World Trade Organization

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## ABSTRACT

*Despite the enormous efforts made by the Government of Ethiopia to address the export sector's issues over the past 20 years, the nation has experienced a trade deficit and a budget imbalance. As a result of the growing disparity between export and import values, Ethiopia's trade balance has been getting worse over time. Therefore, the main objective of the study was to examine the determinants of Ethiopian agricultural exports using a dynamic panel data approach. Specifically, the study was expected to assess the trend, composition, and the major destinations of Ethiopian exports, to identify key determinates of the performance level of agricultural volume and value of export and to identify systemic and operational bottlenecks of agricultural export. The study used panel data for the period 2000-2020 for Ethiopia's top 29 agricultural export commodities. The commodities were chosen based on the basis of volume and value of export and availability of required data during the study period. Using the natural logarithm of agricultural export value of each commodity, and the selected the demand and supply side determinant factors of agricultural export of the commodity-like lag of agricultural export commodity, RGDP, exchange rate, consumer price index, labor force, total road network coverage, corruption index, foreign direct investment, indirect tax revenue, total domestic saving, and trade openness. The result showed that all variables were significant factors that determine Ethiopia's agricultural commodity export. From these determining factors lag of agricultural export, economic growth, Foreign Direct Invest, and Terms of Trade have a positive and significant effect on Agricultural commodity export at one-step system GMM. Whereas the remaining variables are exchange rate, labor force, Gross Domestic Saving, Road, indirect tax revenue, consumer price index, and corruption index have a significant and negative effect on agricultural export. The researcher concluded that lowering corruption and indirect tax on export, and poor quality of the road, gross domestic saving which hinders the agriculture sector (lack of agriculture financing) would motivate private investment in the export sector. Besides, controlling rapid population growth would decrease domestic consumption of exportable commodities and would increase export surplus. Finally the researcher recommended that a concerted effort should be directed towards productive channels of agricultural commodity in the economy so as to enhance sustainable economic growth through increased agricultural commodity export.*

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

# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Countries differ in their resource endowments and technological levels in the production of products and services on this planet (Allaro, 2015). Differences in resource endowments and production processes, on the other hand, will result in a difference in factor prices between nations, which will result in a difference in product pricing. As a result, as predicted by classical trade theories, product price differences are the cause of international commerce (Smith, 1776). More crucially, through specialization, international commerce would improve resource allocation efficiency and promote global output and welfare (Narayan, 2019). Recent experiences in some Asian countries have shown that increasing exports by specializing in high-yield agricultural products at the start of economic development, then labor-intensive products, and finally capital-intensive export products, is critical for changing comparative advantage and structural transformation in developing countries (Cheffo, 2020).

Even though developing countries' part in worldwide commerce has climbed from 25% to 33%, Africa's average proportion of international trade has remained below 3%. Similarly, although Ethiopia has a huge potential for agricultural and horticultural products due to its broad geographical area and diverse climates and temperatures, Ethiopia's average share of foreign commerce has remained below 0.03 percent (World Bank, 2016).

Agriculture contributes significantly to Ethiopia's economy. In 2016 agriculture contributed 36%, 75%, and 85% of the gross domestic product, employment, and foreign exchange profits, respectively (NBE, 2018). Ethiopian agricultural exports, on the other hand, are dominated by a few commodities, with coffee, oilseeds, and pulses accounting for more than half of Ethiopia's overall export value. During 2019/20, the export value of coffee, oilseeds and pulses were 855.9 million USD (28.6%) , 345.0 million USD (11.5%) and 234.8 million USD(7.9%) respectively. During the same period the export volume of pulse, oilseed and coffee were 354.01 million kilogram (28%), 271.11 million kg (21.2%) and 236.50 million kilogram (18.49%) respectively (NBE, 2020). This indicates that Ethiopian exports are more commodity concentrated. In a similar line, Ethiopia's export value to import value ratio was 35% in 2000, while it was only 17% in 2016, 21% in 2019, 25.3% in 2020/21 (NBE, 2021).

The present Ethiopian government, on the other hand, has taken a variety of policy initiatives to address the export sector's problems. The Ethiopian government has taken measures such as simplifying export licensing, currency devaluation, a 70% loan for export-related investment, a preferential interest rate scheme that is 3.5% lower than the interest rate on non-export activity loans, and foreign exchange retention of 10% of earnings (Bekele & Mersha, 2019). Despite these incentives, the disparity between Ethiopian imports and exports has widened during the previous two decades. Exports, for example, increased in value from USD 482 million in 2000 to USD 2,785 million in 2016. Imports, on the other hand, have surged in value from USD 1,392 million in 2000 to USD 16,244 million in 2016 (NBE, 2018).

The export boom from the early 2000s to 2014 was concentrated in a small variety of agricultural commodities after which it declined. Ethiopia's export slowdown not only partially explains the deceleration of growth in the last period but has also prevented Ethiopia from completing the goals set in the second Growth and Transformation Plan, which expected a much larger role for merchandise exports especially in agriculture. This is due to external pressures, such as falling worldwide prices for key agricultural commodities like coffee (Dube et al., 2018). For example, as of 2017, a few agriculture goods represent 77% of merchandise exports. Dynamics of Ethiopia's coffee, gold, cut flowers and other animal and vegetable exports largely explain both the rise and fall of the country's export sector (Goldstein, 2020).

Looking at the above trend, the main reason for Ethiopia's trade balance worsening is the lower increase of export value compared to import value growth. It is certain that the exports of primary goods are less competitive on the world market and weigh less against manufactured goods exported by developed countries resulting in deteriorating terms of trade. Despite these unfavorable terms, the country is still dependent on agricultural exports and the assessment of its impact on the economy will fill the knowledge gap with reference to major agricultural exports.

## **1.2 Statement of The Problem**

Economic growth and structural transformation in developing agrarian economies are dependent on the ability to import capital goods and services, and the ability to import is also dependent on foreign exchange profits through exports (Barrett et al., 2019; Matthes & Kunkel, 2020). Ethiopian exports, on the other hand, are heavily reliant on a few main agricultural items that are subject to sharp internal and external volatility. The composition and commodity concentration of

Ethiopian exports, like that of other emerging nations, has been blamed for the country's export sector's short-term ups and downs. In Ethiopia, for example, coffee has remained the most important export item over the past three decades, followed by oilseeds and pulses (Gizaw et al., 2022).

For the most part, Ethiopia's economic performance has been less than satisfying. Agriculture has been performing at a subsistence level, even though it employs more than 67% of the total employment compared to industry sector and service sector with 9% and 24% of the total employment in 2019/20 (World Bank, 2020). Ethiopia's agricultural has risen at a rate of roughly 5.50% per year over the 2011-2020, far less than service sector with 9.96% and industry sector with 18.06% in the same period. With 21 percent of GDP, industry, a young sector, adds to the country's total performance on average for 10 years (GTP I and II). In contrast to industry, the service sector contributes just 40% of GDP, while agriculture contributes 39 percent on average during GTP I and II (Angrist et al., 2021). The share of agriculture contributing to GDP is declining over the years. The combination of population growth, a lack of technical development and ineffective allocation mechanisms have led to a rapidly decreasing availability of natural resources for many poor farmers resulted in decrease in the volume and value of agricultural production and agricultural commodity export (Wassie, 2020).

The decline in the share of agriculture is an indication of structural shift from agriculture to industry and service sectors (Barrett et al., 2019; Marinoudi et al., 2019). However Ethiopia's agriculture has shown remarkable resilience over many centuries but is now increasingly failing. Equally, Ethiopian agriculture is increasingly failing as farmers work to expand agricultural lands at a great cost to the environment and the delicate ecological system, thereby risking the very fabric of their own livelihood (Diriba, 2018; Tadele, 2021). Systemic obstacles to agricultural and rural transformation in Ethiopia can be summarized as lack of sustained and intergenerational commitments to transformation, constitutional and legal constraints, government crowding out the private sector leadership, lack of mechanization options and constrained input supply system, lack of effective and accountable organizational capacity, lack of agricultural and rural financial and credit facilities and environmental degradation (Wassie, 2020).

The success of agricultural exports has fluctuated during the last three decades. Agricultural exports grew at a fairly slow pace from 1991 to 1995 (Gebregziabher, 2019; Petrikova; 2019;

Goldstein, 2020). The slow growth of agricultural exports during this period was due to a shift in the government system, institutional reforms, political instabilities, the formation of legislative frameworks, and other factors. Liberalization of commerce opened up new opportunities for producers, dealers, and exporters following the overthrow of the Derg regime and the formalization of the EPRDF government.

However, between 1995 and 2001, the rate of increase in agricultural commodity exports was only 4.6% each year. The Ethio-Ertirai battle, which lasted two years and drained resources from the industry, was the main cause of the downturn (Bantie, 2019). To make matters worse, the droughts of 2001 and 2002 had a considerable influence on the agricultural sector's overall performance, but not on export commodities: the volume of export for these commodities in 2002 and 2003 was 2,452,744 and 2,565,186 quintals, respectively (Tolcha, 2020). Nonetheless, exports have decreased by an average of 18.6 percent since 2000.

The export boom from the early 2000s to 2014 was concentrated in a small variety of agricultural commodities after which it declined. Ethiopia's export slowdown not only partially explains the deceleration of growth in the last period but has also prevented Ethiopia from completing the goals set in the second Growth and Transformation Plan, which expected a much larger role for merchandise exports especially in agriculture. This is due to external pressures, such as falling worldwide prices for key agricultural commodities like coffee (Dube et al., 2018). For example, as of 2017, a few agriculture goods represent 77% of merchandise exports. Dynamics of Ethiopia's coffee, gold, cut flowers and other animal and vegetable exports largely explain both the rise and fall of the country's export sector (Goldstein, 2020).

Ethiopia is currently facing a challenging scenario in terms of foreign exchange revenues. The persistent trade deficit over the last two decades, as well as the necessity to borrow to finance it, has resulted in a high degree of foreign exchange shortage and debt burden. In 2020, for example, the debt to gross domestic product ratio was 55.43% (World Bank, 2021). Ethiopia's growth has deaccelerated as a result of the increasing macroeconomic imbalances which have resulted in a shortage of foreign exchange in the economy. For the last two decades, although aid, remittances and foreign direct investment contributed their share of foreign exchange, external borrowing was critical to completing the committed investments, especially since 2009. As Ethiopia reached a ceiling in its access to concessional lending in 2015, and given weak the country's export

performance, Ethiopia was obliged to contract its imports, which led to a growth slowdown in the latest period. The Growth Diagnostic report has shown how the inability of firms to import key components of production is the most proximate cause of the country's slowdown. Shortages in foreign exchange have reduced the output for most economic sectors and increased the exit of firms (Goldstein, 2020). This demonstrated that, despite the government's efforts to diversify Ethiopian export destinations and compositions, the export sector has failed to meet the country's foreign currency needs (Sawore, 2015; Goldstein, 2020).

Given the importance of agricultural exports to Ethiopia's economy, determining the impact of demand- and supply-side factors on Ethiopian agricultural exports is critical. Exchange rates, GDP, population or labor force, institutional quality, and trade policies all affect Ethiopian export (Karamuriro & Karukuza, 2015; Geda & Seid, 2015; Kebede, 2016; Siyakiya, 2016; Hutchinson, 2019; Bantie, 2019; Bereket, 2020). Furthermore, other scholars cited trade openness, foreign direct investment, and infrastructure as factors influencing Ethiopian exports (Gebrehiwot & Gebru, 2015; Geda & Seid, 2015; Gururaj et al., 2016).

However, both theories and evidence show that developing countries in general, and Ethiopia in particular, export primarily agricultural primary products, making it more plausible to figure out the major determinants of agricultural export using dynamic panel data analysis. Furthermore, no empirical research employing a dynamic panel model with the most recent data up to 2020 has been conducted to better understand the dynamics driving Ethiopia's agricultural export flows.

As a result, this study has investigated the issue, and the findings aided in the development of appropriate and relevant interventions. A closer look at the key variables guiding and determining the export trends helped inform future trade policy's prescriptions and assess the magnitude and effects of the key determinants to bridge the previously missed gaps.

### **1.3 The Objective of the Study**

#### **1.3.1 General Objective of the study**

The main objective of the study was to evaluate the Ethiopian agricultural product export performance.

#### **1.3.2 Specific Objectives of the Study**

The specific objectives of the study are:

1. To assess the trend of major Ethiopian agricultural export products and their destinations;



2. Identify key determinates of the performance level of agricultural export.

#### **1.4 Research Question**

Answering the following significant and decisive research questions was used to approach the research problem.

1. What are the trend and major destinations of Ethiopian exports?
2. What are the key determinates of the performance level of agricultural volume and value of export?

#### **1.5 Scope of the Study**

The scope of the study was limited to Ethiopia's major agricultural commodities export to the rest of the world. These agricultural export products that were identified are 29 and include banana, barley, beer of barley, cereal preparations, coffee, cottonseed, flour from cereals, fresh fruit, oilseeds, pulses, meat from sheep, honey, lemons and limes, hops, wine, linseed, meat from cattle, tomato, tea, spices, sesame seed, rapeseed, pastry, orange, oats, onion, pepper, fresh vegetable and frozen vegetable.

The study looked at the factors that influence the volume and value of these 29 major agricultural exports from 2000 to 2020 G.C. This period was chosen because of the completion of the Growth and Transformation I and II and move towards the Home-Grown Economic Reform backed by the 10-Year Development Plan. During those 10 years, the country had been driven by an economy aimed at maintaining agriculture as the major source of economic growth. The completion will enable for a structured, scoped and time-defined analysis of export data and their performances.

#### **1.6 Significance of the Study**

Export knowledge is critical because it is the primary source of employment and has an impact on the Ethiopian economy's growth and development. The study is a valuable source of information for trade policymakers, who require such knowledge to formulate policies. Policymakers, economists, and other interested parties want knowledge on the specific factors that influence exports, as well as the contribution of exports from all sectors to GDP in all countries because exports help to reduce poverty and create jobs (Ipek, 2020).

For interested parties, the study provides knowledge of how major agricultural exports have been behaving and the rationale behind it. Following that, the study informs the government on the

primary focus areas of agricultural export, as well as how to build appropriate interventions if the focus areas necessitate policy changes. The study also assists agricultural export players and institutions in prioritizing problem-solving efforts to improve Agricultural export performance, allowing Ethiopia to reap the greatest possible profit from Agricultural commodity exports.

### **1.7 Limitation of the Study**

The research was limited to the performance of agricultural exports as a whole, in particular agricultural commodities export performance. Furthermore, because Ethiopia has such a vast range of agroecology, institutional capacities, organizations, and environmental conditions, the study's findings may be limited in their ability to generalize and apply to the entire country. Furthermore, the data problem on exports, with a special focus on major agricultural items was anticipated to be the study's most crucial challenge, as various sources have incomplete data.

### **1.8 Organization of The Study**

This research was structured in the following manner: The first chapter contains an introduction to the study, as well as remarks about the topic and the study's goal. The second chapter discusses theoretical and empirical literature, while the third chapter focused on the study's methodological aspects, such as model specification, estimating approach, and variable definition. The fourth chapter examined and discusses the empirical data and model analysis findings. The final chapter, chapter five, presented the conclusion and recommendations of the study's findings.

## **CHAPTER TWO: LITERATURE REVIEW**

### **2.1 Theoretical Literature**

#### **International Trade Theory**

International trade is concerned with the global economic and financial interdependence of nations. It examines the movement of goods, services, money, and excise between a country and the rest of the globe, as well as the policies aimed at controlling these flows and their impact on the welfare of the country. The political, social, cultural, and military interactions of states are impacted by, and in turn influence, this economic and financial interdependence. The basis and rewards from trade are examined in international trade theory. Because they deal with individual nations viewed as single units and the relative pricing of specific goods, international trade theory and policy are the microeconomic components of international economics. The balance of payments, on the other hand, represents the macroeconomic aspects of international economics because it deals with total receipts and payments, as well as regulation and other economic policies that affect the level of national income and the general price level of the nation as a whole. Open-economy macroeconomics or international finance are terms used to describe this type of macroeconomics (Salvatore, 2013). International economics has enjoyed a long, continuous, and rich development over the past two centuries, with contributions from some of the world's most renowned economists, from Adam Smith to David Ricardo, John Stuart Mill, Alfred Marshall, John Maynard Keynes, and Paul Samuelson.

According to Salvatore (2013), several trade ideas have existed from the birth of European civilization and various revolutions in various regions of the world throughout the 17th and 18th centuries during the early medieval times. Mercantile trade theory, classical trade theory, and neoclassical trade theory are the three trade theories.

#### **Mercantilists Trade Theory**

According to Krugman (2003), the publication of Adam Smith's *The Wealth of Nations* in 1776 marked the beginning of economics as an organized discipline. However, when England, Spain, France, Portugal, and the Netherlands grew into modern sovereign nations, works on international commerce before this date (Salvatore, 2013). During the seventeenth and eighteenth centuries, a group of persons (merchants, bankers, government officials, and even philosophers) produced articles and pamphlets on international commerce, promoting the mercantile economic theory. In

a nutshell, the mercantilists believed that the only way for a country to become wealthy and strong was for it to export more than it imported. The more gold and silver a country possessed, the wealthier and more powerful it became. Thus, the government had to do all in its power to stimulate the nation's exports and discourage and restrict imports (particularly the import of luxury consumption goods). However, since all nations could not simultaneously have an export surplus and the amount of gold and silver was fixed at any particular point in time, one nation could gain only at the expense of other nations. The mercantilists thus preached economic nationalism, believing as they did that national interests were basically in conflict (Salvatore, 2013).

International trade, according to the mercantilist notion, enriches exporting countries at the expense of importing countries (Carbaugh, 2011). However, Smith (1776) criticized this view of international trade, claiming that it helps all participating countries. According to Adam Smith's absolute advantage hypothesis, a country should produce and export products in which it has an absolute advantage while importing products in which it has an absolute disadvantage (Smith, 1776). The absolute advantage argument, on the other hand, fails to explain why a country with an absolute advantage in the production of all goods trades with other countries (Carbaugh, 2011).

### **Classical Trade Theory**

Trade between two nations, according to Adam Smith, is based on absolute advantage. When one nation is more efficient (or has an absolute advantage over) another in the production of one commodity but is less efficient (or has an absolute disadvantage concerning) the other nation in the production of a second commodity, both nations can benefit from each specializing in the production of the commodity with which it has an absolute advantage and exchanging part of its output with the other nation for the commodity with which it has an absolute disadvantage. The most efficient use of resources is achieved by this method and the output of both commodities increases. This increase in the output of both commodities measures the gains from specialization in production available to be divided between the two nations through trade (Salvatore, 2013).

Ricardo proposed the law of comparative advantage in his *Principles of Political Economy and Taxation*, which was published in 1817. This is one of the most significant, and it still has a lot of uses (Salvatore, 2013). Even if one nation is less efficient than (has an absolute disadvantage over) the other in the production of both goods, there is still a foundation for mutually beneficial trade, according to the law of comparative advantage. The first nation should focus on producing and exporting the commodity with the smallest absolute disadvantage (this is the commodity with

which it has a comparative advantage) while importing the commodity with the greatest absolute disadvantage (this is the commodity of its comparative disadvantage).

### **Neoclassical Trade Theory**

The word neoclassical comes from the idea that writers were enhancing and expanding on the classical economics' essential principles (Salvatore, 2013). In the late nineteenth and early twentieth centuries, the advent of neoclassical economic theory gave instruments for examining the impact of international commerce in a more accurate and less preventative manner. One of the neoclassical trade theories, the Heckscher–Ohlin theory, claims that the demand for commodities affects the resulting demand for the inputs necessary to manufacture them.

### **Imperfect Substitute Model**

Imports and exports are perfect substitutes in the perfect substitutions model, however, neither imports nor exports are ideal substitutes for domestic goods in the imperfect substitutes model (Goldstein & Khan, 1978). Thus, the coexistence of native and imported commodities is usually observed due to the notion of the imperfect substitutes model. The consumer is considered to maximize utility within budget limitations in the imperfect substitutes model. The amount demanded is a function of gross domestic product, imported goods price, domestic goods price, exchange rate, and tariff, according to the resultant demand function for export. The imperfect substitutes model was utilized as a theoretical framework to evaluate the determinants of Ethiopian agricultural exports in this study.

The most typical of these instances, as Francois and Reinert (1997) point out, is when the trade policies in question are at a degree of sectoral disaggregation that makes using general equilibrium analysis unfeasible. Despite appearing in textbooks, the imperfect substitutes model is used in practical partial equilibrium modeling in applied trade policy analysis (ISM). The ISM is based on Armington's (1969) "Armington assumption," which states that imported and local competing goods are imperfect substitutes for one another. Baldwin and Murray (1977), Rousslang and Suomela (1988), Francois and Hall (1997), and Francois and Reinert (2009), among others, refined in poor countries, how crucial is the imperfect competition?

It is quite important, according to stylized facts and casual empiricism. Perfect competition or any recognizable facsimile of it is often notable by its absence outside of peasant agriculture and some services. A few firms tend to dominate in a wide range of manufacturing areas, and one believes

that they make extensive use of their market dominance. Of course, the same may be true about wealthy nations. However, it appears that imperfect competition is more prevalent in emerging nations' industrial sectors than in industrialized countries.

## **2.2 Empirical Literature**

Several noteworthy perspectives on the impact of the exchange rate on agricultural exports have been stated in the literature. While some experts assess the impact of changes in the nominal exchange rate on exports, policymakers prefer to use the real exchange rate since it can adjust for buying power variations between trading partners' currencies. In contrast to the nominal exchange rate, where rate increases represent currency depreciation, real exchange rate increases reflect currency appreciation, with the two having opposite implications for exports.

Nadeem et al. (2012) go into greater detail about how tax, income, and the exchange rate affect Pakistan's export performance. Using time-series secondary data from 1981 to 2011, the study attempts to explain the factors affecting Pakistan's export performance. All feasible elements in the export function that could affect export performance were considered in the study. The study's dependent variable calculates the volume of Pakistan's exports. World income, as measured by growth in worldwide demand for various items, GDP, FDI, nominal exchange rate, indirect tax, industrial value-added, as assessed by adding all outputs and subtracting intermediate inputs, and Gross National Savings are among the independent factors (GNS). As a result, the study's findings revealed that foreign direct investment and gross national savings have little impact on Pakistan's export performance. While industrial value-added, indirect taxes, global income, GDP, and the nominal exchange rate all have a beneficial impact on exports.

Previous research has indicated a positive and significant association between the exchange rate and the value (volume) of exports (Allaro, 2015; Bereket, 2020; Karagöz, 2015; Karamuriro & Karukuza, 2015; Siyakiya, 2016). Other studies (Mengistu, 2014; Sertoglu & Dogan, 2016; Victoria & Samuel, 2017; Zeray & Gachen, 2014) established a negative and statistically significant association between the exchange rate and export volume. However, a study on the determinants of Vietnam's exports (Haitho, 2013) discovered a negative and significant association between the exchange rate and the volume of export.

Previous research has demonstrated a positive and significant association between the gross domestic product and agricultural exports (Bekele & Mersha, 2019; Cheffo, 2020; Geda & Seid,

2015; Haitho, 2013; Hutchinson, 2019; Kebede, 2016). However, a study by Karamuriro and Karukuza (2015) on the factors of Uganda's export success using panel data from 1980 to 2012 indicated a negative and significant link between export and GDP.

Previous research has discovered a negative and significant association between agricultural export volume and foreign direct investment (Boansi et al., 2014; Gururaj et al., 2016; Mengistu, 2014; Zeray & Gachen, 2014). On the other hand, a study on the determinants of export in Vietnam conducted by Haitho (2013) discovered a positive and significant relationship between export and foreign direct investment.

Some research found a favorable and significant association between trade openness and agricultural export volume (Bekele & Mersha, 2019; Bereket, 2020; Boansi et al., 2014; Cheffo, 2020; Gebrehiwot & Gebru, 2015). Furthermore, certain studies (Bekele & Mersha, 2019; Gebrehiwot & Gebru, 2015; Geda & Seid, 2015; Kebede, 2016) discovered a favorable and significant association between labor and agricultural exports. However, a study by Boansi et al. (2014) on the factors of agricultural export trade in Ghana discovered a negative and substantial relationship between the labor force and agricultural export volume.

Some studies (Gururaj et al., 2016; Narayan & Bhattacharya, 2019) identified a negative and substantial link between the consumer price index and agricultural export. Furthermore, some studies discovered a positive and significant link between institutional quality and agricultural exports (Bekele & Mersha, 2019; Gebrehiwot & Gebru, 2015; Sawore, 2015), while others discovered a positive and significant link between infrastructure and agricultural exports of developing countries infrastructure (Bereket, 2020; Kebede, 2017).

### **Determinants of Agricultural Export**

Many elements play a role in achieving outstanding export results. Gross domestic product, foreign direct investment, the exchange rate, infrastructure development, the economy's openness, indirect taxes (duties), and other factors are all examined when determining export performance. As a result, their empirical explanations are as follows:

#### **Gross Domestic Product**

Many empirical studies have been undertaken to determine the performance of exports. Fugazza (2004) conducted a detailed analysis that employed panel data for 84 countries from 1980 to 1999. Export performance was utilized as the dependent variable and GDP was used as the independent

variable, with GDP being found to have a positive and significant impact on export performance. Bilateral trade flows between two countries, on the other hand, are believed to be proportional to their respective GDP levels. Higher-income economies are more interested in product differentiation and specialization, as a result of which they trade more (Ahmed & Sallam, 2018; Kiani et al., 2018; Uysal & Mohamoud, 2018; Gbetnkoum & Khan, 2020).

Similarly, Yishak (2009) investigates the factors that influence Ethiopia's export performance. For the period 1995–2007, a gravity model is used with panel data from 30 Ethiopian trading partners. The Generalized Two Stages Least Squares (G2SLS) approach is used to estimate the model. As a result, he discovered that GDP has a beneficial impact on Ethiopian exports.

Agasha (2006) used the VEC model to investigate the factors that influence Uganda's export growth rate. Quarterly data from 1987 to 2006 was used by the researcher. The researcher calculated the export growth rate as a function of GDP and other export trade factors. The long-run co-integrating regression demonstrated that Gross Domestic Product had a favorable impact on export growth rate. Belayneh and Wendaferahu (2013) investigated the factors of export performance using an econometric model for the years 1970/71 to 2010/2011. They incorporated both supply and demand of associated variables in a long linear form export determination model. The influence of GDP on export performance was positive, which was in line with Majeed and Ahmed's (2006) estimates of developing nations' exports. In the long run, an economy's output capacity has an impact on supply capacity through sustaining a country's competitiveness in the international market.

### **Real Effective Exchange Rate**

The old approach held that depreciation of the exchange rate would encourage exports while discouraging imports, and that appreciation of the exchange rate would discourage exports while encouraging imports. According to Gupta & Varshney (2021), such conclusions frequently overlook the presence of a considerable percentage of import content in exported items, as well as the dynamic implications of productivity increases on export. According to the same study, Singapore's exports are unaffected by exchange rate appreciation because its exports have a significant import content.

The country's export performance is significantly influenced by its exchange rate regime, particularly the actual exchange rate. Various studies have demonstrated that as the country's



export prices decline concerning world prices, demand for the country's exports rises. The devaluation of its currency against other currencies, particularly the dollar, reduces the cost of its exports on the worldwide market. For example, Shaik & Gona (2021) discovered that as India's export prices fell, demand for its commodities surged. They also stated that the appreciation of the Indian rupee harmed Indian exports at one point. A competitive exchange rate is also linked to export growth, according to the argument.

### **Foreign Direct Investment**

Despite the debates about the advantages and costs, FDI is expected to boost export performance in emerging nations. The evidence from several nations suggests that FDI plays a significant role in changing the composition of exports. Inflows of foreign direct investment (FDI) into Singapore, China, Lesotho, Madagascar, and Mauritius, for example, have helped to boost the technological content of their exports by promoting the development of knowledge-based sectors. This large and favorable link between export performance and FDI has aided capital formation. FDI contributes to technological advancement and is then expected to be focused on creative activities inside an existing sector, stimulating mostly intra-sectoral diversification rather than inter-sectoral diversification, according to UNCTAD (2005). Similarly, foreign interest in a local firm and export activities are likely to have a beneficial relationship, owing to the MNE's access to superior production, technology, and management know-how that the local firm can acquire (Ozdemir, 2017).

Two types of production arrangements are known to exist in multinational corporations, according to FDI theories. Horizontal integration and vertical integration (Horstman and Markusen, 1992). Vertical integration is likely to facilitate trade by increasing capital equipment and factor services exports from the home country, as well as resource-based product exports. Given that multinational corporations have relocated their manufacturing for exporting from their home country to the host country, horizontal integration is a substitute trade (Wen et al, 2021).

Nonetheless, the empirical evidence on the impact of FDI on exports is contradictory. According to certain cross-country research, international commerce and foreign direct investment are substitutes and are adversely associated (Furtan & Holzman, 2004; Wang et al., 2019). Others, on the other hand, find that they are mutually beneficial and favorably connected (Grosse and Trevino,

1996). Furthermore, according to a study conducted in Ireland (Osabohien et al, 2021), FDI has a significant impact on export performance.

In Ethiopia, where export-oriented FDI is actively supported and numerous incentives are offered to international investors who invest locally, the level of FDI will almost certainly boost export performance. As a result, FDI is predicted to have a beneficial impact on the export performance of agriculture.

### **Indirect Tax**

Majed and Ahmed (2006) aimed to investigate the factors that influence export success. 75 developing nations were studied using panel data from 1970 to 2004. They employed an export equation with explanatory factors such as FDI, GDP, growth rate, real effective exchange rate, indirect taxes, and labor forces as explanatory variables. They attempted to determine the impact of indirect taxes, which they believed would be detrimental to the manufacturing choice. They couldn't rule out the potential that the government's fiscal incentives might have a favorable impact on exports. This will happen if governments offer tax breaks to encourage the export sector to grow. Indirect taxes, on the other hand, might have a detrimental impact on export performance. Furthermore, the impact of indirect taxes in Ethiopia before 1991/92 is projected to have a detrimental impact on export performance. The rationale is that there were no such export promotion incentives before 1991/92. However, there was a huge push to encourage export after 1991/92. The exemption of indirect taxes was one of the promotion mechanisms. As a result, this variable is projected to have a favorable impact on export.

### **Consumer Price Index**

A number of studies focus on the dynamic relationship of inflation with import and export. Using monthly time series data for the Turkish economy over the period 1995 to 2010, the study of Ulke et al. (2011) shows that there is a long-run and dynamic relationship between inflation and import. A unidirectional causality from import to inflation is also found in that study. Abidemi and Malik (2010) have critically analyzed the dynamic and simultaneous inter relationship between inflation and its determinants in Nigeria. Johansen cointegration technique and error correction model are used to analyze determinants of inflation for the time series data for the period from 1970 to 2007. The findings reveal that among others variables imports have positive association with inflation.

Gylfason (1997) studied on the relationship between export and some of its determinants including inflation by statistical methods in cross-sectional data covering 160 countries. He concludes that high inflation has tended to be associated with low exports. Moreover, his study shows that exporters of primary commodities to have more inflation than the exporters of manufactures.

### **Trade Openness**

In North Africa, Bakari and Mabrouki (2018) searched for the influence of agricultural export on economic growth between 1982 and 2016, using the static gravity model. Their empirical results showed that agricultural policy has significant impact on agricultural investment and trade openness policies in the region. Equally, Uysal and Mohamoud (2018) analysed the impact on export performances of seven East African countries, using data from World Development Indicators between 1990 and 2014 and suggested the need to replace agricultural exports with industrial export, improve infrastructural facility, the quality of human capital and the need for policies to attract international investors.

Makki and Somwaru (2004) were applied the panel data of 66 developing countries over three years on the impact of foreign direct investment and trade openness on economic growth. The study estimates a system of three equations, where dependent variables are the growth rate of GDP per capita and domestic investment. Temporarily, the independent variables are FDI, inflation rate, trade openness, government consumption, and human capital. The study confirms that foreign direct investment relates positively to the trade to stimulate economic growth and domestic investment in developing countries.

### **Corruption Index**

Looking at the channels tying rents to corruption that have been identified earlier in the literature, an encompassing ingredient is that from an individual firm's perspective higher rents always map into more intense rent-seeking (e.g. Ades & Di Tella 1999). The bulk of the evidence concerns resource exports (e.g. Treisman 2007), with the core underlying mechanism being common to all studies: higher rents accruing either from more valuable markets (size and/or value) or from larger market power (and thus higher margins) generate higher rent-seeking incentives (Dalgaard & Olsson, 2008).

Murphy et al. (1993), Robinson (1994) and Acemoglu (1995) all develop theoretical setups where rentseeking proves detrimental to the economy because of the adverse effect this has on the

productive sector, thereby crowding out entrepreneurial activity. As such, revenue windfalls incentivize firms to reallocate resources to rent-seeking activities, eventually resulting into a reduced equilibrium entrepreneurial activity. Inefficiencies may equally emerge when groups with power and influence in the society push for increased redistribution in the presence of windfalls, and this in turn contains the incentives to invest in productive sectors, thereby resulting in lower growth rates. This mechanism has been coined the “voracity effect” (Lane and Tornell, 1996; Tornell & Lane, 1999), and is supported by empirical evidence (Arezki & Brückner, 2012; Abbott & Jones, 2013; Abbott et al, 2015). Rather than conceptualizing an economy composed of a rent-seeking sector and a productive sector, we instead consider the rent-seeking-production trade-off at the firm rather than the aggregate level, and view bribes as an input of a firm’s revenue. By making the natural assumption that firms’ revenues are non-linear in market size, bribes, and inputs, we uncover a non-linear relationship between exports and bribes, thus contrasting with all existing literature on the topic. Moreover, and always in contrast to much of the existing literature, the effects we uncover result from corruption strategies adopted by firms operating in both the manufacture and the service sectors, and not in the resources sectors specifically (e.g. Treisman 2007).

### **Labor Force**

Finally, Sampson (2014) incorporates labour assignment into a Melitz (2003) model to study the effects of trade on wage inequality when both worker and firm heterogeneity are taken into account. This model extends the labour assignment framework of Costinot and Vogel (2010) to describe matching between workers and large, monopolistically competitive firms. It considers an economy in which firms are heterogeneous in technology, workers are heterogeneous in skills, and the skill and technology distributions and the total numbers of workers and firms are endogenous. Human capital accumulation is determined by the returns to skill and the human capital investment costs, so that workers exit the labour force if wages fall below their outside option. From the firm’s perspective, entry, exit and research and development (R&D) decisions depend on the fixed costs, the technologies available and the nature of the markets.

Labour is the only factor of production, and each worker’s productivity depends on the technology used by the employer and his or her skills. Along with the assumption that firms select their employees so as to maximize profits in a perfectly competitive labour market, these conditions imply that firms with better technologies offer higher wages to highly skilled workers, leading to

positive assortative matching between these two groups. The resulting model is used to analyse how trade integration influences the matching of workers to firms and wage inequality. As in Melitz (2003), trade is a costly opportunity for firms to enter new foreign markets and exports are subject to variable iceberg trade costs. The positive assortative matching between skills and technology previously described gives rise to firm-size wage premiums and exporter wage premiums. Owing to the fixed costs of exporting, only the technologically advanced, high-skill firms export, shifting the firm technology distribution upwards. Under these conditions, wage inequality is typically higher in the presence of trade than in autarky. Trade increases wage inequality among highly skilled workers in exporting firms, but has an ambiguous effect on inequality among workers at the bottom of the wage distribution.

### **Domestic Saving**

Domestic financing plays a crucial role in the revenue collection efforts of developing countries. A high rate of domestic savings provides the necessary resources needed for financial independence, sustained economic growth, and the attainment of the Sustainable Development Goals.

### **Road network**

A Road Network is a system of interconnecting lines and points on a map that visualize a system of streets for a certain area. Public transportation infrastructure is conceived as a cost-saving factor, in addition to being a growth-enhancing factor in the growth models through the role of infrastructure as a key element of a country's ability to produce and move goods. In this respect, public infrastructure spending constitutes a remarkable policy tool to promote economic development. Performing transport activities with improved infrastructure increases gains from economic activities. New trade routes due to a dense transportation network create new markets and stimulate economic policies to enhance growth for high volume transport economies. Thus, improved, cheaper, and intensified transportation of freight and passengers constructs strong influence on economic growth via trade (Sturm, Jacobs, and Groote 1999; Spens and Kovacs 2006; Lakshmanan 2011). Development of roads, railways, harbors, airports, and waterways as transport networks is considered as one of the major engines of trade-based economic growth (Wilson et al. 2003).

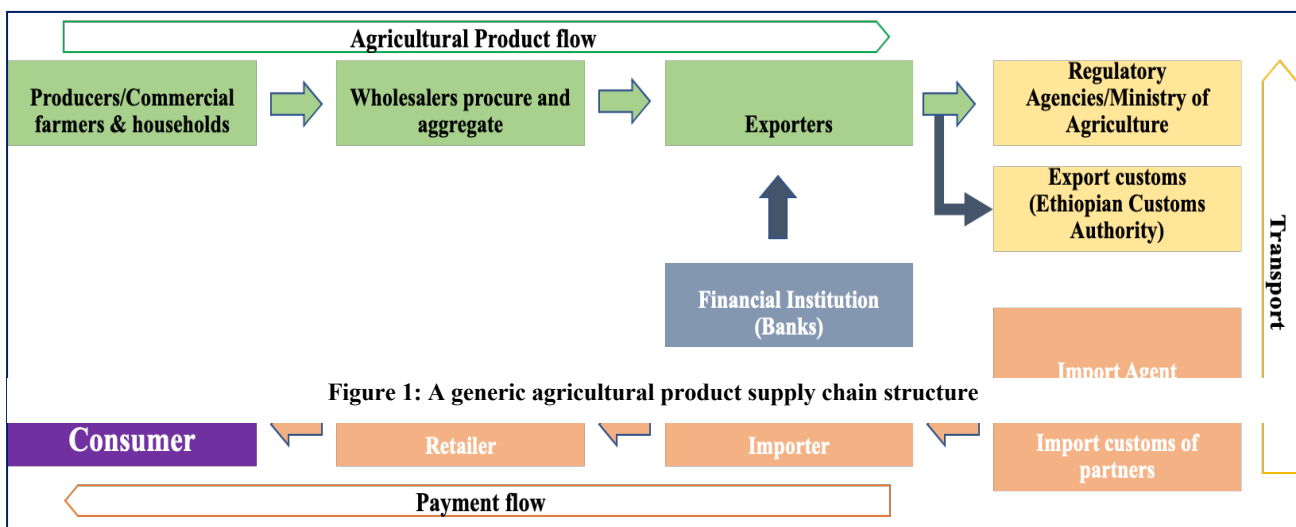
### 2.3 Systematic and operational bottlenecks of Agricultural Export Products

Agricultural supply chain is generally considered the most complex in terms of movement of goods and services especially due to their time and temperature sensitive nature. Significance of import quotas and export subsidies has lowered over the last decade, while the agricultural products are reported to have largest number of non-tariff measures (NTM) complaints compared to that of other sectors (Liu & Wang, 2022). Agro- trade suffers from a range of constraints causing time delays and incurring additional cost leading to increased transaction cost for traders. These include cumbersome custom procedures, poor capacity of meeting product standards and regularly varying standards, unavailability of proper trade logistics services, lack of trade finance and infrastructure issues such as poor border facilities.

- **Procedures are complicated and cumbersome for agro-products**

In general, a trader must follow national trade procedures and, where relevant, the trade procedures of the importing country. Traders must execute a series of actions pertaining to commercial, transportation, regulatory, and financial issues for each transaction procedure. To obtain payment from an importer, an exporter must produce a Purchase Agreement or a Sales Invoice; a bill of lading; several filed documents for export licenses or quota; multiple receipts, and so on.

Ethiopia’s export sector has grown rapidly in recent years, but the country’s businesses would be performing even better in international markets were they not held back by an array of non-tariff measures (NTMs). According to a new survey by the International Trade Centre (ITC) of Ethiopian exporters, importers, and producers, 96% of trading enterprises indicate challenges with NTM registration and implementation. Exports are substantially more affected than imports: 90%



of exporting companies report dealing with burdensome NTMs, compared to only 56% of importing companies. Coffee, oilseeds, other agricultural goods, textiles, leather products, and other manufacturing are the six economic sectors covered by the NTM Business Survey. NTM-related barriers have the greatest impact on leather products. One-fifth of the export-related hurdles, according to the report, are technical constraints imposed by domestic authorities or trading partners. The most common burdensome issues identified by organizations are product identity and quality standards.

A generic agricultural supply chain for an exporter is depicted in Figure 7. Due to requirements for fumigation certifications, export quota clearance, and other factors, the processes for agricultural products are more complicated and require additional documentation. These requirements frequently entail acquiring several authorizations, submitting more documentation, and following time-consuming specialized procedures, all of which result in duplicate data entry and visits to other agencies. This further complicates and delays the trading transaction, even before the product is shipped.

In Ethiopia, the export procedure for an application must be submitted to the NBE that is accompanied with the export contract, seller's invoice, export license of seller, TIN, export permit application, letter of seller stating that consignment will be settled within 90 days maximum and any other relevant document. Note that the exporter must notify the Ministry of Trade that a contract deal has been made with a buyer within 15 days of the conclusion of the contract for export. In addition the export of some goods from Ethiopia is restricted, for example animal feed. For these, the exporter must obtain an export permit from the relevant regulatory body prior to submitting an export declaration.

- **Accessing Information is Difficult**

Trade-related information restrictions include inaccessibility, the lack of organized information, and transparency. In Ethiopian economies, precise information about trade rules, regulations, and procedures is difficult to come by. Exporters require a never-ending supply of data regarding export markets, consumers, competitors, customs procedures, licensing restrictions, and financial resources, among other things. This is a significant difficulty for traders, as they are unable to plan for regulatory compliance. This is especially difficult for agro-products because product standards

and compliance requirements change often, and exporters need current information to ensure compliance.

Traders need information on operational procedures, office opening hours, border control schedule and procedures, port procedures, tariffs and fees, new or additional changes in product standards requirements, financial regulations, and other trade- transaction-related information. This information is typically published in the official gazette, notices from relevant agencies, or newspaper articles. However, often these announcements are published in a delayed manner through these channels and often not easily accessible by public.

The main cause of market thinness in developing countries is the presence transaction costs caused by poor transport and information infrastructure and lack of efficient market institution. These transaction costs imply that farmers are often effectively prevented from taking advantage of price difference between markets, and have insufficient information about the final demand and value of their produce.

The agricultural market in Ethiopia, like most markets in developing countries, is plagued by market imperfections caused by thin markets: low density and high transportation costs, insufficient market information about prices, supplies, and inter-regional grain flows in other markets, inadequacy of storage facilities, weak producer bargaining power, imperfections in the marketing chain, and a lack of universally applicable and enforced contracts.

- **Too-much Paperwork Delays Transaction**

Trade procedures require exchange of data between the trader, custom authorities, other relevant ministries/agencies, border authorities and service providers such as freight forwarders in Ethiopia. A significant amount of paperwork is required to perform the exchange of information. Paperwork is usually time-consuming and can result in delays and duplication of information. For agricultural products, these paper-based regulations define thresholds such as the percentage of coffee beans that may be broken beans or the amount of pesticide residue beyond which a food would no longer be deemed safe for consumption.

These rules are in place to safeguard customers' health and safety. Meeting these standards and gaining corresponding certificates, on the other hand, can be costly and time-consuming for exporters. Much of the compliance cost stems from the time it takes to get required paperwork,



inspection delays, a lack of testing and certification infrastructure in the country, and a mismatch between the poor quality of local inputs and the high-quality needs of foreign markets. Automation is a widely accepted solution to address this problem. However, there is varied level of automation achieved by Ethiopia is not yet well developed and structured. While some developed and emerging economies fully automated trade transaction procedures including e-SPS (Sanitary and Phyto-sanitary) certificates, most developing economies like Ethiopia have gained inadequate or no automation processes to reduce paperwork. As a result of these too much delayed paper work has a great effect on the export of agricultural products.

- **Delays at the Border**

Another major impediment in processing agricultural products are border delays. Border delays often degrade the quality of agricultural products, lowering their worth. This is the primary rationale for speeding up border controls. Landlocked countries are particularly vulnerable to ineffective border controls. Some of the key procedure-related concerns include excessive physical inspection, a lack of cooperation among domestic border agencies and between adjacent countries, long customs clearance on both sides of the border, and limited operating hours at border stations. Border controls are further hampered by a lack of openness, the complexity of procedures, and frequent changes in procedures.

For example, Ethiopian agricultural exporters must go through a lengthy customs clearance process at the border. All cargoes are inspected, amount and value of products are recorded, clearance order is given, and export clearance is signed by Customs before cargo is dispatched to the destination after providing with minimum 10 required documents to Customs control. Lack of interagency collaboration is one of the primary concerns at the border. Customs has traditionally been the lead coordinating agency at borders, with assistance from other agencies such as Veterinary and Health, Banks, Immigration, and so on.

- **Inadequate quality infrastructure**

A robust quality infrastructure provides assurance to agricultural traders. It improves an economy's competitiveness by offering a platform for ensuring product quality and better standard compliance. Product conformity is critical for agricultural exports to get entry to the European Union and other developed markets. Access to Asian emerging markets is becoming increasingly vital, especially as countries like China have begun to place greater emphasis on such issues for

their importing partners. Because developing countries continue to struggle to reach international standards, the development of standards could be discussed separately.

In a developing country like Ethiopia, a firm's capacity to explore commercial prospects, compete on global markets, and participate in global value chains may be harmed by underdeveloped national quality infrastructure. Many businesses struggle to demonstrate compliance with quality standards and trade rules imposed by trading partners. Given Ethiopia's strategic focus on the growth of light manufacturing, improving product quality and raising awareness of and adherence to international product standards are critical. Many Ethiopian producers, however, find it difficult to comply with better product standards and quality methods. Many buyer-requested tests and certificates are not available from any internationally recognized domestic institution, forcing companies to spend exorbitant fees to have tests performed abroad.

- **Weak Market Linkages**

The market structure, which includes commercial ties and conditions of trade (sometimes informal) among various participants in the chain, as well as access to market information, has an impact on rural logistics and agro supply chains. The absence of a link between producers and processors or exporters higher up the value chain causes a slew of problems. Small producers frequently lack the resources to organize modern transportation and logistical services. They rely on intermediaries to provide these services. As a result, it costs them money when intermediaries induce unnecessary delays since the price of the goods drops.

The business ethics of these middlemen often affect market information on pricing and demand. The inefficiency of price signal dissemination could also be due to a lack of price information. Even though consumer prices are high, due to misinformation, producers may not receive any additional incentive and so may not be able to negotiate a decent deal. As a result, spoilage, transportation, and related logistics services are caused not just by poor rural infrastructure, but also by weak market links. Landlocked developing countries like Ethiopia and least developed countries score badly on the World Bank's logistics performance index (LPI), indicating that such challenges require more attention.

- **Agricultural financing**

Both the demand and supply side of the money market in Ethiopia is constrained by multiple factors adversely affecting the realization of financial inclusion. In the recent years, the geographic reach and penetration of banks among the population has shown improvement. Small and medium sized enterprises (SMEs) are the backbone of agricultural value chains in most developing countries. They aggregate the outputs of smallholder farms, for example as traders and off-taking processors. However, SMEs often lack access to finance to play their roles, to leverage on their own investment, and to generate economic growth. Many of them are neither served by commercial banks nor by microfinance institutions.

From the point of view of the financial sector, agriculture is a less attractive field of business than other sectors of the economy such as construction, tourism, trade, and other services. One key reason for this is the sector's risk-return profile. Typical collateral in the agricultural sector is agricultural output, farming equipment, land or buildings. Agricultural output is typically perishable, which limits its use as collateral. The limited amount of standardization of agricultural output in Ethiopia and the availability of few "neutral" storage facilities further complicate the use of agricultural output as collateral. While a legal framework for moveable collateral such as farming equipment exists, practical considerations limit this type of collateral to large, standardized machinery that is mostly in use by a relatively limited number of commercial farmers. Since farmers generally cannot own land titles, land is also not acceptable collateral in this business. This also complicates the use of buildings as collateral.

One major cash outflow/loan (for example, for fertilizer) is followed by one huge cash inflow/repayment several months later (harvest). Agricultural clients are more difficult to monitor than firms with various cash inflows and outflows since the ease of monitoring individual customers grows with the frequency of repayments (because each individual return provides a monitoring opportunity). "Lumpy" cash flow patterns impede financial intermediation for financial institutions where agriculture is the dominant economic sector, in addition to complicating monitoring.

## **2.4 Research Gap and Conceptual Framework**

This study found the gap that there are limited empirical studies on agricultural export performance in Ethiopia based on a well-informed assessment of distinct empirical literature. There are limited a few studies that look at the performance of agricultural commodities using a panel data technique and address Ethiopia's regional and federal agriculture sector administrative structures. Despite this, there have been studies on the performance of Ethiopia's agricultural exports, with the majority of studies focusing on coffee, one of the country's key export commodities, while other key commodities such oilseed and sesame were disregarded. Because most studies on panel agriculture-focused inquiries are frequently cross-sectional, there are limited to few types of research on the export performance of most agricultural commodities from the perspective of business and management. In terms of concept, this study examined the determinants of Ethiopian agricultural exports using the imperfect substitution model as a theoretical framework. Policies and implementation were examined from the perspectives of agricultural export sector structures, as well as export actors and practices essential to the agricultural export sub-role. Finally, the conceptual framework consists of dependent variables which are the volume and value of agricultural export. The detailed explanation of dependent and independent variables is briefly explained in chapter three in the methodology part.

## **CHAPTER THREE: RESEARCH METHODOLOGY**

### **3.1 Research Design**

A research design is a framework that outlines the methodologies and procedures for gathering and interpreting data. The aims of the researchers dictate the study design. Because the goal of this was to look at the factors that influence the volume and value of agricultural export in Ethiopia from 2000 to 2020, quantitative research will be used to test the objective hypothesis by examining the relationship between variables. The research used longitudinal research design.

Longitudinal or panel data analysis refers to the statistical analysis of pooled data which consists of a cross-section of units (e.g., countries, firms, households, individuals) for which there exist repeated observations over time. A panel design is used when researchers sample a group, or panel, of participants and then measure some variable or variables of interest at more than one point in time from this sample. The study used Panel research design since it fits the secondary data. As a result, secondary panel data was gathered from domestic and international data sources and relevant institutions. The qualitative research of inquiry was used to improve and provide a more complete understanding of the study topic. To put it another way, combining quantitative and qualitative research realized the benefits of a mixed research approach by eliminating the bias that comes with employing only one form of study.

### **3.2 Data Type**

The data type used in this study is quantitative data type. The analysis employed a sample of 29 Ethiopian agricultural export commodities for the period 2010 - 2020, based on data availability. In this study, data on 29 export goods will be collected for twenty years, resulting in a panel data set with 609 observations.

These products include banana, barley, beer of barley, cereal preparations, coffee, cottonseed, flour from cereals, fresh fruit, oilseeds, pulses, meat from sheep, honey, lemons and limes, hops, wine, linseed, meat from cattle, tomato, tea, spices, sesame seed, rapeseed, pastry, orange, oats, onion, pepper, fresh vegetable and frozen vegetable.

### **3.3 Data Sources**

Secondary data were acquired from a variety of domestic and foreign institutions to meet the study's stated research objectives. The Food and Agricultural Organization (FAO), World Development Indicators (WDI), annual report of the National Bank of Ethiopia, Ministry of Trade and Regional Integration, Worldwide Governance Index, and Ethiopian Economic Association or Ethiopian Economic Policy Research will all be used to collect secondary data.

The FAO (2022) has provided statistics on the export values of main agricultural exports, the exchange rate, the gross domestic product, and the labor force, while the National Bank of Ethiopia's annual report and the Ministry of Trade and Regional Integration will provide data on total export and total import values. The WDI has also provided data on the consumer price index, foreign direct investment, and openness. Finally, the Worldwide Governance Index provided information about Ethiopia's corruption index.

According to World Governance indicator database (2022), the corruption indicator's value ranges from  $-2.5$  (poor governance) to  $2.5$  (good governance), and it will be converted into an index with a value between 0 and 1 by dividing the sum of the maximum and actual values by the maximum value minus the minimum value. As a result, a score around zero indicates poor governance or high corruption, whereas a value near one indicates strong governance or low corruption.

### **3.4 Model Specification**

As discussed in the theoretical and empirical literature section, trade theories have been improved over time to make them more suitable for studying determinants of export performance. The focus here is solely on advancements gained through the introduction of extra explanatory factors into the model on which this study's model is based. This research applied a dynamic panel data model approach, which employs panel data on agricultural commodities, to obtain acceptable expected outcomes.

When compared to time series or cross-sectional data sets, panel data has the advantage of allowing the identification of specific parameters or equations without the need for restrictive assumptions. Because repeated data on the same units are available, economists can construct and estimate more intricate and realistic models than they could with a single cross-section or a single time series (Lillo et al., 2018; Sul, 2019; Zyphur, 2020). Furthermore, the primary benefit of panel data over

cross-section data is that it provides the researcher with greater freedom in modeling differences in behavior between people (Frees; 2004; Hsiao, 2007; Wooldridge, 2010).

The absolute advantage hypothesis (Smith, 1776), comparative trade theory (Ricardo, 1951), Heckscher–Ohlin theory (Heckscher, 1919), choice similarity theory (Linder, 1961), and new trade theory (Krugman, 1983) have all focused on the causes of international commerce. The gravity model, on the other hand, explains the factors that influence the volume of trade flows between countries. Furthermore, the imperfect substitutes model of international commerce posits that a country's export value or volume is determined by its gross domestic product, exchange rate, domestic price level, and tariff revenue. As a result, the imperfect substitutes model of international trade was used as a theoretical foundation for this research (Goldstein & Khan, 1978)

Our econometric model is based on the equation of Olper (2001), Majeed et al (2006), Idsardi (2010), Amoro & Shen (2013), Tesfaye (2014), Abolagba et al (2010), and with some modifications based on Kahfi (2016), Kiani (2018), Reinert (2020), and Nasrullah et al (2020) to come up with the specification of the model. Based on the theoretical and empirical literature as well as the availability of data, the imperfect substitutes model of international trade is mathematically specified as:

$$X_i^d = f(Y, EXR, T, P, Z) \dots \dots \dots (3.0)$$

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.

A dynamic panel data model is designed and estimated to assess the relative relevance of internal and external factors affecting Ethiopian agriculture export performance. Thus using semi logarithm, a dynamic panel data model for the determinants of Ethiopian agricultural exports for 29 export categories for the period 2010–2020 is given as follows:

$$\ln Ex_{it} = \beta_0 + \beta_1 \ln Ex_{it-1} + \beta_2 \ln GDP_{it} + \beta_3 \ln CPI_{it} + \beta_4 \ln IT_{it} + \beta_5 \ln REER_{it} + \beta_6 Opne_{it} + \beta_7 CI_{it} + \beta_8 \ln LF_{it} + \beta_9 \ln FDI_{it} + \beta_{10} \ln S_{it} + \beta_{11} \ln Road_{it} + \alpha_i + u_{it} \dots (3.1)$$

where  $\ln Ex_{it}$  is the natural logarithm of export volume or value of an  $i^{\text{th}}$  item at year t,  $i = 1, 2, \dots, 10$ ,  $t = 2010, 2011, \dots, 2020$ ,  $\ln Ex_{it-1}$  is one period lagged value of the logarithm of export value,  $\ln GDP_{it}$  is the logarithm of the gross domestic product,  $\ln CPI_{it}$  is the logarithm of the

consumer price index,  $\ln IT_{it}$  is the logarithm of indirect tax revenue,  $\ln REER_{it}$  is the logarithm of the exchange rate,  $OPE_{it}$  is trade openness,  $CI_{it}$  is the corruption index of Ethiopia,  $\ln LF_{it}$  is the logarithm of the labour force,  $\ln FDI_{it}$  is the logarithm of foreign direct investment,  $\ln S_{it}$  is the logarithm of saving,  $\ln ROAD_{it}$  is the logarithm of road coverage in kilometers,  $\alpha_i$  is the export item-specific fixed effect,  $U_{it} \sim N(0, \sigma^2)$  is the random term,  $\alpha_i$  and  $u_{it}$  are independently and identically distributed.

### 3.5 Description of Variables

**The value of export ( $\ln Ex_{it}$ ):** It is the logarithm of the value of each of Ethiopia's agricultural export items, measured in US dollars. while  $\ln Ex_{it-1}$  is the logarithm of each agricultural export item's one-period lagged value. In this study, the coefficient of one period lagged value of the outcome variable in (3.1) should be positive.

**Economic Size ( $\ln GDP_{it}$ ):** The actual gross domestic product (GDP) is a measure of the total value of goods and services produced by a country's economy. It's utilized as a proxy for a country's supply capability. Other things being equal, an increase in real GDP has a beneficial impact on export performance (Kiani et al., 2018; Uysal & Mohamoud, 2018; Bake & Yuya, 2020; Liu et al., 2020; Yoon, 2021). GDP measures the value of marketable goods and services generated over a certain period. There are some non-tradable items and services that have no direct impact on sesame export performance. Because data on direct investments made to provide sesame for export markets is difficult to come by, GDP should be used as an independent supply capacity for sesame export performance.

**Consumer Price index ( $\ln CPI_{it}$ ):** It is the logarithm of the consumer price index. The Consumer Price Index (CPI) tracks the average change in prices for a basket of goods and services over time. The Consumer Price Index (CPI) is used to track the average changes in prices that consumers pay for products and services over time. In essence, the index aims to quantify an economy's aggregate price level and hence evaluate the purchasing power of a country's currency unit. In a theoretical sense, export and inflation are antithetical to one another. Inflation raises the price of products and services on the global market. Only if demand for domestic export in other nations is inelastic will the export of products and services increase (Fleming, 19962; Mundell, 1963).



**Indirect Tax Revenue ( $\ln IT_{it}$ ):** It is the logarithm of the total indirect tax value in US dollars, and it is projected to harm company production decisions. However, if the government provides fiscal incentives such as tax exemptions to boost the export sector, indirect taxes are projected to have a favorable impact on the value of agricultural exports (Emran & Stiglitz, 2005; Khurana & Sharma, 2016).

**Exchange Rate ( $\ln REER_{it}$ ):** It is the logarithm of Ethiopia's exchange rate, and it is intended to have a favorable impact on a country's exports. This is because currency depreciation is thought to increase a country's competitiveness. As a result, the exchange rate coefficient is predicted to be positive. About Ethiopia's key trading partners, the true effective exchange rate is determined. European nations, African nations, Australian nations, East Asian nations, and Middle Eastern nations are among them. The REXR for a particular time is measured as by:

$$\underline{REER} = \frac{NEER * DP}{FP} \dots\dots\dots (3.2)$$

Where NEER is the nominal exchange rate, DP is the domestic price, Fp is the foreign price.

Because the actual effective exchange rate accounts for differences in purchasing power, it is the most accurate way to quantify the impact on export growth. According to Couharde et al (2018), Thuy & Thuy D.T. (2019, Nguyen & Do (2020), the supply response to the price incentive expressed by real exchange rate depreciation has a considerable impact on goods export. As a result of the increased export performance caused by real effective exchange rate depreciation, the projected relationship between REER and export value is positive.

**Trade Openenes ( $Opne_{it}$ ):** While there is a strong and positive association between real exchange rate and export growth in the long run, according to Agasha 2009, the short-term relationship is not significant. Another study, conducted by Sharma in 2000, discovered a positive relationship between depreciation in the real exchange rate and export performance, demonstrating that depreciation in the real exchange rate makes exports cheaper in the global market, thereby stimulating demand and improving overall export performance. using dynamic panel GMM approaches Das (2016), Hossain & Mitra (2013) found that trade openness is positively connected with exports.

$$\boxed{Opne_{it} = \frac{m_{it} + x_{it}}{y_{it}}} \dots\dots\dots (3.3)$$

Where  $m_{it}$  is the total value of import at time t,  $x_{it}$  is the total value of export at time t,  $y_{it}$

Is the real gross domestic product of the country at time t.

**Corruption Index ( $CI_{it}$ ):** The Corruption Perceptions Index assigns a score to nations and territories depending on how corrupt their government is thought to be. Corruption, according to the CPI, is defined as "the abuse of public power for private gain." In underdeveloped countries, the corruption perceptions index variable has a larger impact on export and import volume than in rich countries. This result suggests that because the corruption perceptions index is higher in developing nations, it will have a greater beneficial impact on exports and imports than in rich countries. It is reasonable to assume that, as a result of the inefficiency of developing countries' work processes, the cost of doing business in developing countries is a significant burden for firms.

**Labor Force ( $\ln LF_{it}$ ):** It is the logarithm of the total number of workers, and its impact on agricultural export is determined by whether the workers are competent or unskilled. The effect on export for skilled labor predicted to be positive, whereas the effect on export for unskilled labor is expected to be negative. Employment tends to shift towards more productive industries, which in turn has driven productivity growth. Cline (2004) estimated that an increase in the trade to GDP ratio. Labor force is measured as the total number of people above age of eighteen years or older, who are employed or who are unemployed and seeking employment.

**Foreign Direct Investment ( $\ln FDI_{it}$ ):** Depending on whether the government directs foreign direct investment to agricultural export sectors or non-agricultural industries, the coefficient of the logarithm of foreign direct investment in US dollars,  $\ln FDI_{it}$  might be positive or negative. The coefficient of foreign direct investment in (2) is predicted to be positive if foreign direct investment leads to the production of exportable agricultural products. However, if non-agricultural sectors get foreign direct investment, the coefficient of foreign direct investment in (2) is projected to be negative.

**Total Saving ( $\ln S_{it}$ ):** It is the logarithm of domestic saving in US dollars, and it is projected to have a positive impact on export levels because a higher level of saving would result in a larger volume of commodities available for export.

**Road ( $\ln Road_{it}$ ):** A higher road network is predicted to improve agricultural exports, according to the coefficient of the logarithm of the road network in kilometers. The total travel distance and area accessible for a given year.

### 3.6 Method of Data Analysis

The study used descriptive and econometric analysis tools. Descriptive statistics such as mean, standard deviation, minimum and maximum values are used to describe economic size, volume of export, real effective exchange rate, indirect tax revenue, labor force foreign direct investment, corruption index, trade openness. Using Arellano bond GMM dynamic panel model estimation, the study analyzed the influence of explanatory variables on the dependent variable.

Arellano–Bond (Arellano and Bond 1991) and Arellano–Bover/Blundell–Bond (Arellano and Bover 1995; Blundell and Bond 1998) dynamic panel estimators are increasingly popular. Both are general estimators designed for situations with 1) “small T, large N” panels, meaning few time periods and many individuals; 2) a linear functional relationship; 3) one left-hand-side variable that is dynamic, depending on its own past realizations; 4) independent variables that are not strictly exogenous, meaning they are correlated with past and possibly current realizations of the error; 5) fixed individual effects; and 6) heteroskedasticity and autocorrelation within individuals but not across them. Arellano–Bond estimation starts by transforming all regressors, usually by differencing, and uses the generalized method of moments (GMM) (Hansen 1982), and is called difference GMM.

### 3.7 Specification and Estimation Procedure

Many econometric relationships are dynamic, and the advantage of panel data is that they allow the researcher to better understand the dynamics of adjustment. These dynamic relationships are characterized by the presence of a lagged dependent variable among the regressors (Baltagi, 2005; Sul, 2019; Tsionas, 2019; Parker, 2020). For a dynamic panel data approach, the general framework of an autoregressive model of order of  $p$  with additional regressor  $x_{it}$  could be specified as (Baltagi, 2005):

$$\boxed{Y_{it} = \theta_1 Y_{it-1} + \dots + \theta_p Y_{it-p} + X'_{it} \beta + \alpha_i + \varepsilon_{it}; t = 1, \dots, T, i = 1, \dots, N} \dots\dots\dots (3.4)$$

Where  $\alpha_i$  is a time-invariant individual effect whose treatment may be fixed or random,  $\varepsilon_{ijt}$  represents a disturbance term assumed to be uncorrelated with  $X_{it}$ , but for our case, the general

specification of equation (4) reduces to a first-order model. In a static panel data model choosing between fixed or random effects yields a consistent and efficient estimator, whereas in a dynamic model the opposite exists because it will depend upon  $\alpha_i$  irrespective of the way we treat the latter (verbeek, 2004). A within estimator applied to a first-order autoregressive model yields consistent estimates only when the number of periods  $T$  is very large (Green, 2003). (Arellano & Bond, 1991), introduced a two-step procedure based on differencing and instrumenting which is a consistent and efficient estimator. The first step consists of differencing the dynamic equation to remove the individual effects ( $\alpha_i$ ). (Cameron & Trivedi, 2005) Wrote the first step of the procedure as:

$$\Delta Y_{it} = \theta_1 \Delta Y_{it-1} + \dots + \theta_p \Delta Y_{it-p} + \Delta X'_{it} \beta + \Delta \varepsilon_{it} \dots \dots \dots (3.5)$$

$\Delta$  is the first order differential equation expressing the change of the dependent variable by the effect of its lagged value and exogenous regressors. In this regard, we assume that  $\varepsilon_{it}$  are serially uncorrelated, otherwise, estimators are inconsistent. The second step deals with instrumental variable (IV) estimation of the first differenced (FD) model that uses appropriate lags of the dependent variable as instruments. According to (Drukker, 2008), these couple of steps does lead to consistent parameter estimates. The fixed or random effects panel data estimators are not appropriate even for the FD equation. In contrast to a static model, ordinary least squares on the FD data produce inconsistent estimates because the regressor  $\Delta Y_{it-1}$  is correlated with the error  $\Delta \varepsilon_{it}$ , even if the  $\varepsilon_{it}$  are serially uncorrelated. For serially uncorrelated  $\varepsilon_{it}$ , the FD model error term  $\Delta \varepsilon_{it} = \varepsilon_{it} - \varepsilon_{it-1}$  has correlation with  $\Delta Y_{it-1} = Y_{it-1} - Y_{it-2}$  because  $Y_{it-1}$  depends on  $\varepsilon_{it-1}$ . However,  $\Delta \varepsilon_{it}$  is uncorrelated with  $\Delta Y_{it-k}$  for  $k \geq 2$ , opening up the possibility of IV estimation using lagged variables as instruments (Cameron & Trivedi, 2005).

The Arellano-Bond estimator employs an IV estimation strategy based on the assumption that  $E(Y_{ik}, \Delta \varepsilon_{it}) = 0$  for all  $k \leq t-2$  in the levels equation, so that the lags  $Y_{it-2}, Y_{it-3}, Y_{it-4}$ , and so forth can be used as instruments in the first differenced equation. In the case of the system GMM estimator, we consider the additional condition that  $E(\Delta Y_{it-1}, \varepsilon_{it}) = 0$  and incorporate the levels equation utilizing  $\Delta Y_{it-1}$  as an instrument (Cameron & Trivedi, 2005). Similar additional moment conditions can be added for endogenous and predetermined variables, whose first differences can be used as instruments.

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

$$\ln Ex_{it} = \beta_0 + \beta_1 \ln Ex_{it-1} + \beta_2 \ln GDP_{it} + \beta_3 \ln CPI_{it} + \beta_4 \ln IT_{it} + \beta_5 \ln REER_{it} + \beta_6 Opne_{it} + \beta_7 CI_{it} + \beta_8 \ln LF_{it} + \beta_9 \ln FDI_{it} + \beta_{10} \ln S_{it} + \beta_{11} \ln Road_{it} + \alpha_i + u_{it}$$

..... (3.6)

$$\Delta \ln Ex_{it} = \beta_1 \Delta \ln Ex_{it-1} + \beta_2 \Delta \ln GDP_{it} + \beta_3 \Delta \ln CPI_{it} + \beta_4 \Delta \ln IT_{it} + \beta_5 \Delta \ln REER_{it} + \beta_6 \Delta Opne_{it} + \beta_7 \Delta CI_{it} + \beta_8 \Delta \ln LF_{it} + \beta_9 \Delta \ln FDI_{it} + \beta_{10} \Delta \ln S_{it} + \beta_{11} \Delta \ln Road_{it} + \Delta u_{it}$$

.... (3.7)

All variables are in natural logarithms except openness and corruption index. Using the latest version of Arellano/Bond GMM estimation, equation (3.7) is first estimated to determine the determinants of agricultural export. Since the Arellano-Bond method generates several instruments (for large T) leading to potentially poor performance of asymptotic results (when the number of groups is small), we have employed the least possible number of instruments. The Stata/SE 13.0 computer software was employed for estimation.

### 3.8 Econometrics Estimation Procedures

- **Serial Correlation**

For consistent estimation of dynamic models, the GMM estimators require that the error term ( $\varepsilon_{it}$ ) be serially uncorrelated (Stata13, 2013). Specifically, if  $\varepsilon_{it}$  are serially uncorrelated, then  $\Delta \varepsilon_{it}$  are correlated with  $\Delta \varepsilon_{it-1}$  because  $Cov(\Delta \varepsilon_{it}, \Delta \varepsilon_{it-1}) = Cov(\varepsilon_{it} - \varepsilon_{it-1}, \varepsilon_{it-1} - \varepsilon_{it-2}) = -var(\varepsilon_{it-1}) \neq 0$ . Conversely,  $\Delta \varepsilon_{it}$  will not be correlated with  $\Delta \varepsilon_{it-k}$  for all  $k \geq 2$ . A test of whether  $\Delta \varepsilon_{it}$  is correlated with  $\Delta \varepsilon_{it-k}$  for  $k \geq 2$  can be performed by using the Arellano-Bond tests for serial correlation (Roodman, 2006). The literature assures that rejecting the null hypothesis of no serial correlation at order one in the first-differenced errors does not imply that the model is wrong. Rejecting the null hypothesis at higher orders rather implies the invalidity of the moment conditions generated (Drukker, 2008), (Gebreyessus, 2011), (Roodman, 2006), (Cameron & Trivedi, 2005) and (Stata13, 2013).

- **Over identifying Restrictions**

Many devices are used to estimate a limited number of parameters under the instant circumstances suggested by dynamic panel data (DPD) models. As a result, the combined validity of these over-

identifying constraints must be evaluated. That process is carried out by the traditional GMM test, also known as the Sargan (1958) test of over-identifying constraints (Bowsher, 2002). Nonetheless, the Sargan test has an asymptotic chi-squared distribution only for a homoskedastic error term (Stata13, 2013). Accordingly, (Bowsher, 2002) discovered that the Sargan test had no power in panels of dimensions that are routinely used in empirical studies. When robust standard errors are supplied, the test does not completely work (generate a test statistic).

Arellano & Bond (1991) demonstrated that in the presence of heteroskedasticity, a one-step Sargan test over-rejects valid instruments, but a two-step test tends to under-reject weak instruments. In both models, over-identifying, limitations are invalid in one-step estimation but very valid in two-step estimation. One possible option is to use an expanded version of the system GMM estimators created by Roodman (2006). When robust standard errors are supplied, it allows one to run the Hansen (1982) J test of over-identifying constraints.

- **Heteroskedasticity**

While estimating DPD models, the default GMM estimators yield homoskedastic standard errors. Several authors, however, strongly recommend that robust standard errors need to be applied to account for heteroskedasticity (Cameron & Trivedi, 2005; Drukker, 2008; Stata13, 2013). The Breusch and Pagan (1980) test of residuals was performed to check whether heteroskedasticity exists. The idea of the test lies on the auxiliary regression of squared residuals upon explanatory variables including the constant.  $N(T-1)$  times  $R^2$  of the auxiliary regression, having an asymptotic chi-squared distribution with degrees of freedom equal to the number of regressors produces the desired statistic (Verbeek, 2004).c

- **Endogeneity**

Economic size (a country's GDP) is treated as an exogenous variable in the gravity model of trade (Bergstrand, 1985). Despite such interventions, there is theoretical and empirical evidence that trade has an impact on income factors (Batra, 2014; Ram & Prasad, 2007; Rahman, 2009). Causation can therefore go in both directions in the model. If this is the case, regression findings with exogenous income treatment may be deceptive. As a result, endogeneity should not be completely ruled out in equations (3.6) as well. In the GMM setup, the lagged levels and initial differences of the endogenous variables are employed as instruments to account for such possible difficulties.

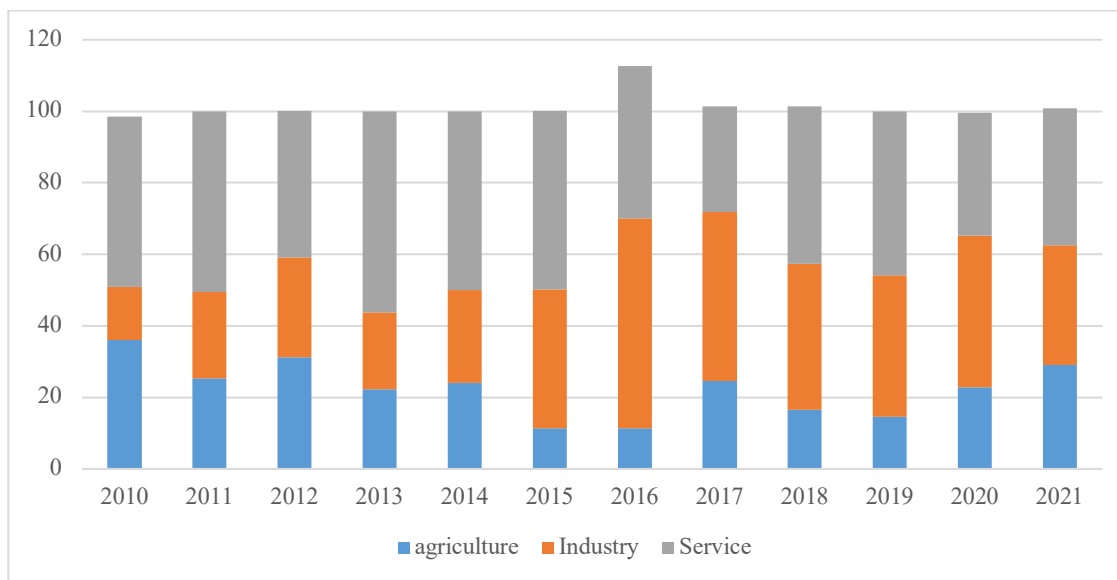
## CHAPTER FOUR: RESULT AND DISCUSSIONS

### 4.1 Overview of Ethiopian Agricultural Exports

#### Structural Overview of Ethiopian Economy

The growth was largely driven by substantial public investment on infrastructure coupled with a solid performance by the service and construction sectors that benefitted from some modest mobility of labor from the agricultural sector. Figure 1 shows that out of the 8.94 % average real GDP growth registered between 2010 and 2021, the agricultural sector contributed 22.4%, industry 34.65%, and service 44.15%. In recent years, the contribution of the service and the industry sectors to real GDP growth has been increasing. For real GDP growth in 2010, the agricultural sector contributed about 36% while the service sector, industry sector including construction contributed the remaining 46.9% and 14.9% respectively. In 2021, however, the service sector, the industry sector (including construction) and agriculture contributed 38.4%, 33.6% and 29% respectively. In fact, the service and construction sectors have become the dominant drivers of GDP growth in recent years.

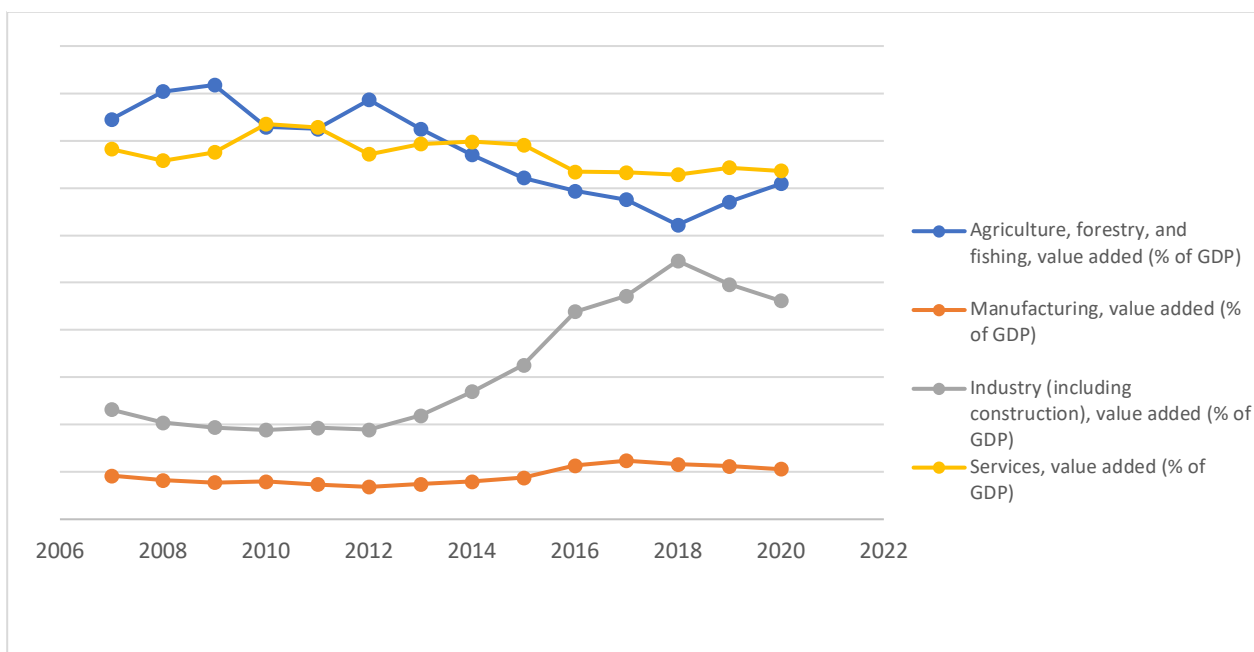
Figure 2: Sectoral Drivers of GDP Growth (% contribution to growth)



Source: Authors Computation using NBE, 2020/21

In terms of sectoral contribution to real GDP, the service sector has overtaken agriculture since 2014 (Figure 2). In the year 2007, the share of the agricultural sector to GDP was 42.26% while the service sector contributed 39.1% and the remaining 16.7% came from the industrial sector. In 2020, the service sector contributed 36.8% of GDP while the agricultural sector contributed 35.45%, where the fast-growing industrial sector contributed around 28%.

Figure 3: Trends in sectoral shares of GDP



Source: Authors Computation using WDI, 2022

### Performance and contribution of agriculture sector to the country's economy

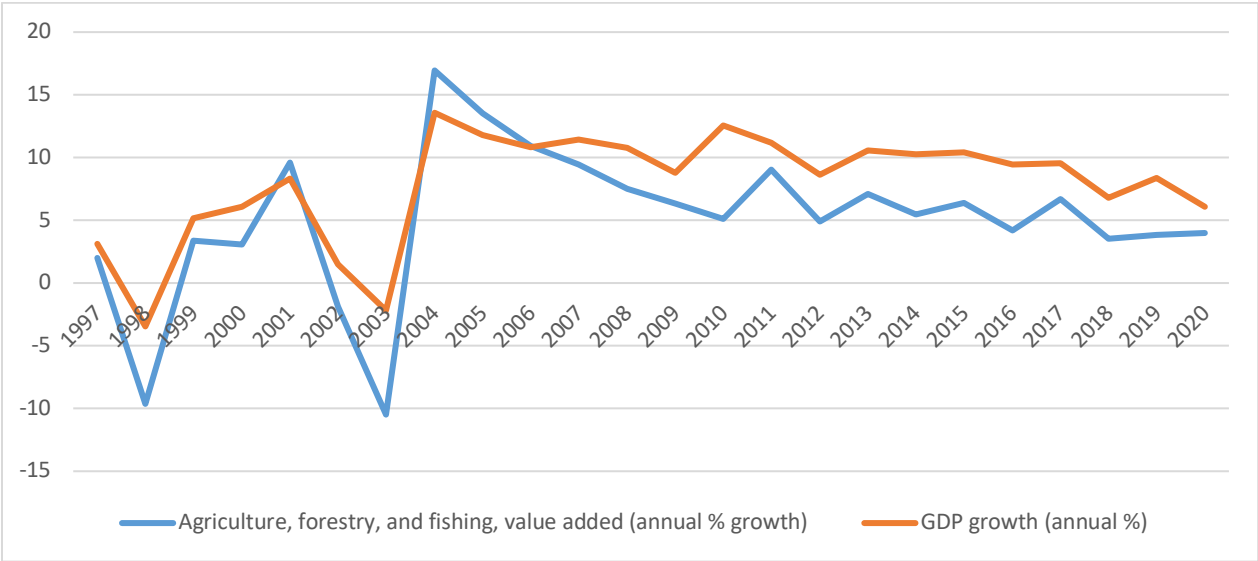
The Ethiopian economy continued to register growth in 2020/21 amid the instability in northern part of the country and the impact of COVID-19 pandemic. During the review fiscal year, real GDP showed a 6.3% growth, slightly higher than the 6.1% growth last year. The growth of real GDP was 3.7% point lower than the average growth rate target set in the Ten Years Development Plan, but significantly higher than the 3.4% growth estimate of the Sub - Saharan African countries (IMF and WEO Update, June 2020). The growth of the Ethiopian economy is projected at 8.7% in 2021/22 compared to 4.9% growth forecast for the world and 3.8% for Sub-Saharan Africa economies (IMF, 2021).



The growth of real GDP in 2020/21 was attributed to the growth of industry (7.3%), services (6.3%) and agriculture (5.5%). Meanwhile, agriculture grew by 5.5% in 2020/21, higher than the 4.3% growth recorded in the previous year mainly due to improvement in crop production, animal farming and hunting. According to NBE (2021), the share of agriculture in GDP declined to 32.5% while its contribution to GDP growth improved to 29% compared to the preceding year. According to NBE (2021), crop production had a lion’s share in agriculture accounting for 65.1% where animal farming & hunting and forestry had a 26% and 8.6% respective share. While crop production showed a 5.7% growth, animal farming & hunting and forestry registered 5.8% and 3.9% expansion, respectively.

There are two major facts that emerges from observing Figure 3. The first one is that, the trend shows the rhythmic co-movement of GDP and agricultural sector growth which clearly confirms the very fact that Ethiopia’s economy is highly dependent on the rain-feed agriculture. The second fact on the other hand is the erratic nature of both agriculture and GDP growth as they are highly suspicious to the vagaries of nature in the sense that GDP registers the highest figure when there is good rain and the lowest comes otherwise (Alemyehu, 2011). In this regard, the major challenge for Ethiopia is to sustain its current growth rate while ensuring that growth is also dynamic as agriculture still remains the country’s largest source of growth.

Figure 4: Ethiopia's GDP and Agriculture Growth Rates (1997-2020)

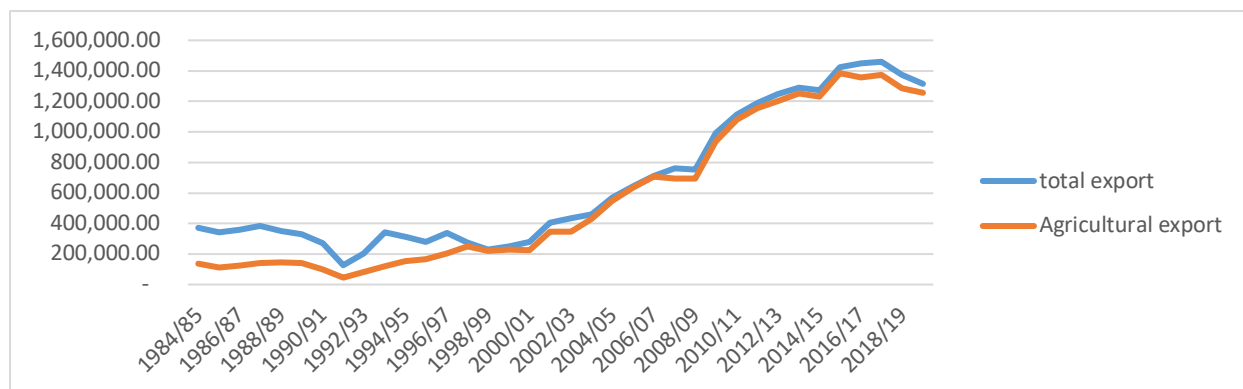


Source: Authors Computation using data from NBE, 2020/21

## Contribution and Performance of the Agricultural Export to export

Coming to agricultural sector's contribution to the countries overall export earnings, agricultural export items including coffee, oilseeds, pulses, flowers, and fruits and vegetables aggregately in 2019/20 exported 1.25 Billion metric ton which takes 95.5% share of the total country's export volume (NBE, 2019/20). Export volume from agricultural sector, as it is indicated by the below figure is relatively stable with a progressive growth trend and the total export volume is highly dependent on the agricultural sector.

Figure 5: Trend of total and agricultural export in volume



Source: Author computation using data from MoT, 2021

## Value and Volume of Agricultural Export

Total merchandise export in 2021/21 amounted to USD 3.6 billion showing a 21.1% annual growth owing to higher export earnings from coffee (6.3%), gold (24.2%), flower (11.4%), chat (24.1%), electricity (36.2%), fruits & vegetables (17.7%) and meat & meat products (11.7%). The increase in export earnings from coffee stood at USD 909.4 million driven by 15.9% rise in international price despite 8.3% drop in its export volume. The share of coffee in total merchandise export revenue declined to 25.1% from 28.6% last year (NBE, 2021). The reason for the declined in the share of coffee during the period was the Covid 19 pandemic shock as well as the increasing the export value of other export commodities such as Gold and mineral. In addition, the declining price of coffee price in the world market during that period as the demand is decreasing.

In the same way, export revenue from flower grew 11.4% and reached USD 470 million as world price increased 7.6% and 3.6%, respectively. However, the share of flower in total export earnings declined to 13.0% from 14.1% a year ago. Receipts from chat export amounted to USD 402.5

million depicting a 24.1% annual growth due to a 24.6% increase in export volume despite 0.5% fall in international price. Thus, the share of chat total export earning stood at 11.1%. Revenue from export of fruits & vegetables increased 17.7% as export volume rose 16.0% and international price 1.5%. However, their share in total merchandise export receipts slightly declined to 1.9% from 2.0% a year earlier. Receipts from meat & meat product export went up 11.7% over last year wholly driven by 14.1% increase in export volume despite a 2.1% drop in international price. However, their share in total export revenue constituted just 2.1%. On the other hand, export earnings from oilseeds declined 2.7% and stood at USD 335.5 million due to a 6.3% fall in world price although its export volume increased 3.8%. Hence, revenue from oil seeds accounted for 9.3% of the total merchandise export earnings.

Proceeds from pulses export slightly dropped (0.4%) and generated USD 233.8 million as export volume declined 20.7% despite a 25.6% increase in international price. As a result, its share in total merchandise export decreased to 6.5% from 7.9% in the previous year. Export earnings from live-animals decreased 17.0% owing to 10.7% decline in export volume and 7.1% in international price. Thus the share of live animal in total merchandize export decreases to 1.2% in 2020/21 from the previous year.

**Table 1: Value of Major Export Items from 2018/19-2020/21 in millions of USD**

Particulars	2018/19		2019/20		2020/21		Percentage Change	
	A	%	B	%	C	%	B/A	C/B
<b>Coffee</b>	764.1	28.7	855.9	28.6	909.4	25.1	12.0	<b>6.3</b>
<b>Oilseeds</b>	387.8	14.5	345.0	11.5	335.5	9.3	-11.0	<b>- 2.7</b>
<b>Leather &amp; Leather products</b>	117.4	4.4	72.0	2.4	36.5	1.0	-38.6	<b>-49.4</b>
<b>Pulses</b>	272.3	10.2	234.8	7.9	233.8	6.5	-13.8	<b>- 0.4</b>
<b>Meat &amp; Meat Products</b>	88.6	3.3	67.4	2.3	75.3	2.1	-23.9	<b>11.7</b>
<b>Fruits &amp; Vegetables</b>	60.9	2.3	58.8	2.0	69.3	1.9	- 3.4	<b>17.7</b>
<b>Textile &amp; Textile Prod.</b>	152.9	5.7	168.9	5.7	147.1	4.1	10.5	<b>-2.9</b>
<b>Live Animals</b>	45.8	1.7	54.1	1.8	44.9	1.2	18.1	<b>-17</b>
<b>Chat</b>	303.6	11.4	324.4	10.9	402.5	11.1	6.9	<b>24.1</b>
<b>Gold</b>	27.9	1.0	196.5	6.6	672.0	18.6	604.5	<b>242</b>
<b>Flower</b>	256.6	9.6	422.3	14.1	470.6	13.0	64.6	<b>11.4</b>
<b>Electricity</b>	55.8	2.1	66.4	2.2	90.5	2.5	19.2	<b>36.2</b>
<b>Others</b>	132.9	5.0	121.1	4.1	129.5	3.6	-8.9	<b>7</b>
<b>Total Export</b>	<b>2,667</b>	<b>100</b>	<b>2,988</b>	<b>100.0</b>	<b>3,617</b>	<b>100</b>	<b>12</b>	<b>21</b>

Source: Authors Computation using MoT and NBE, 2020/21

Table 2: Volume of Major Export Items from 2018/19-2020/21 in millions of Kilograms

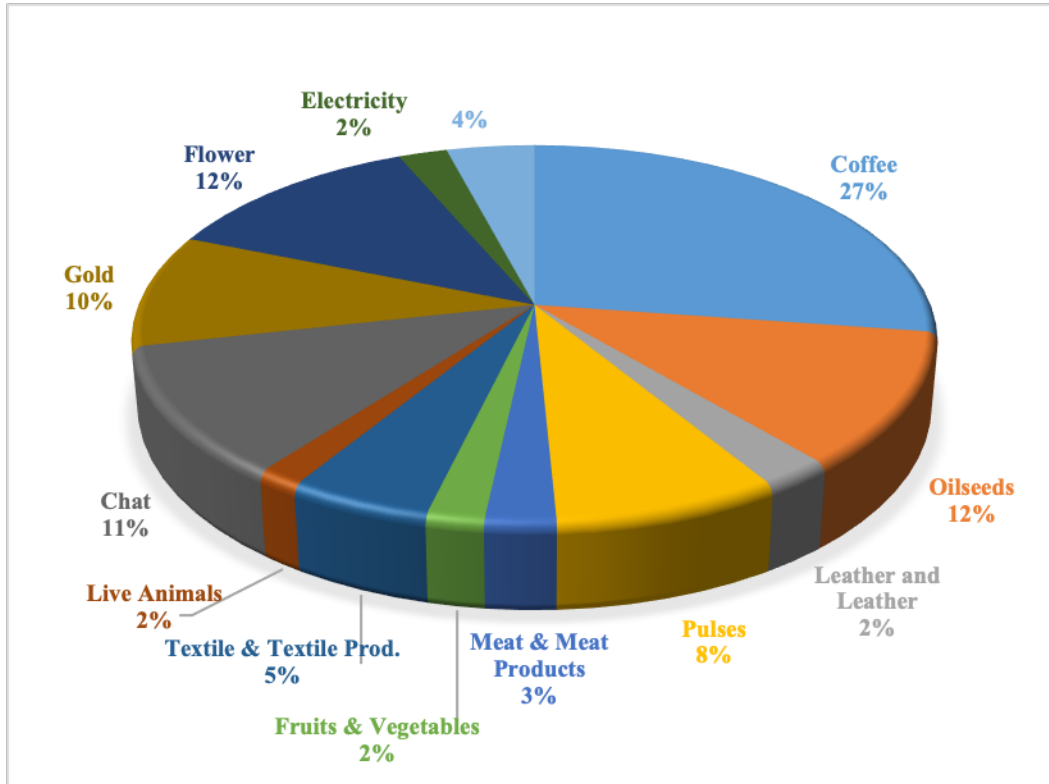
Particulars	2018/19	2019/20	2020/21	Percentage Change	
	A	B	C	B/A*100 - 100	C/B*100 - 100
<b>Coffee</b>	230.93	271.11	248.65	17.40	<b>-8.28</b>
<b>Oilseeds</b>	260.00	236.50	245.48	-9.04	<b>3.79</b>
<b>Leather &amp; Leather Products</b>	5.59	3.55	2.29	-36.48	<b>-35.50</b>
<b>Pulses</b>	462.82	354.01	280.60	-23.51	<b>-20.74</b>
<b>Meat &amp; Meat Products</b>	17.72	12.82	14.63	-27.65	<b>14.13</b>
<b>Fruits &amp; Vegetables</b>	175.62	191.18	221.70	8.86	<b>15.96</b>
<b>Textile &amp; Textile Prod.</b>	19.89	22.80	24.05	14.63	<b>5.47</b>
<b>Live Animals</b>	24.35	29.40	26.26	20.74	<b>-10.66</b>
<b>Chat</b>	53.57	57.14	71.21	6.67	<b>24.63</b>
<b>Gold (In mn. of grams)</b>	0.82	3.32	9.56	306.55	<b>187.68</b>
<b>Flower</b>	57.85	94.39	101.58	63.17	<b>7.62</b>
<b>Electricity(In mn of kwh)</b>	<b>968.59</b>	<b>1,145.25</b>	<b>1,637.22</b>	<b>18.24</b>	<b>42.96</b>

Source: Authors Computation using MoT and NBE, 2020/21

Ethiopia's export dependence on few primary commodities has worsened the vulnerability of receipt instability from merchandise export. The export receipt from six commodities, namely coffee, oilseeds, Pulses, Chat, flower, and Gold has accounted the lion's share that any effect on these dominant commodities' price could adversely affect the entire external trade balance (NBE, 2021). According to annual report 2020/21 of the National Bank of Ethiopia, these six export items jointly generated around 77% of the total export proceeds over the period 2018/19–2020/21. Moreover, coffee, oilseeds, and gold alone contributed more than half of the total earnings in the last three years (see figure 5).

As shown in the figure below, coffee with 27%, flower with 12%, oilseeds with 12%, chat with 11%, pulse with 8%, meat and meat products with 3%, and fruits and vegetables with 2% are the major export items of agricultural sector in particular and Ethiopian major export items in particular with the total share of 75% of the total export item.

Figure 6: Share of Major export Items



Source: Authors Computation using MoT and NBE, 2020/21

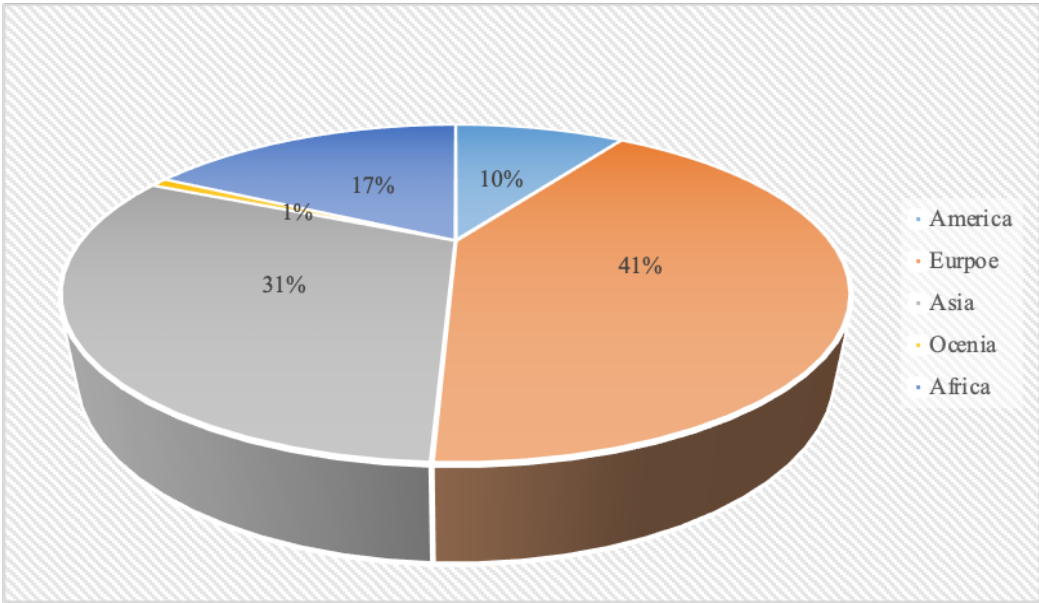
### Direction of Agricultural Export

As far as Ethiopia's geographical distribution of trade is concerned, the major destinations for Ethiopian agricultural export during 2019/20 were Asia, Europe and Africa. Europe accounted for 41 percent of Ethiopia's total export of goods. Switzerland was the largest market for Ethiopia's export with a 45.4% share in total export earnings followed by the Netherlands (19.7%), Germany (8.9%), Belgium (6.1%), Italy (3.2%), United Kingdom (2.2 %), France (1.9 %), Turkey (1.5%) and Spain (1.0%). These countries had 89.9% share in Ethiopia's total export of goods to Europe during 2019/20.

Asia had a 31.0% share in Ethiopia's total export of goods, with exports to Saudi Arabia accounting for 18.7%, followed by United Arab Emirates (14.7%), India (6.7%), Japan (6.6 %), South Korea (6.1%), China (6.0%), Israel (6.0 %), Singapore (4.5%), Indonesia (2.8%), Yemen (2.8%) and Taiwan (1.7%). These countries altogether constituted 76.6% of Ethiopia's total export to Asia.

Ethiopia’s export destined to African countries had a 17% share. The exports were mainly to Somalia (33.5%), Djibouti (15.0%), Sudan (13.5%), Kenya (1.5%), South Africa (1.0%), Nigeria (1.0%) and Egypt (0.8%), which altogether accounted for 66.2% of the total export of goods to Africa. America constituted 10% of Ethiopia’s total goods export of which, 81.2% went to the United States, 5.0% to Canada and 0.6% to Mexico. These countries accounted for 86.8% Ethiopia’s total export of goods to America.

Figure 7: Total Export by Country of Destination



Source: Authors Computation using MoT and NBE, 2020/21

## 4.2 ECONOMETRICS MODEL RESULT

### Summary of Descriptive Statistics results

Prior to commencing the necessary tests and regressions, it is fundamental to establish the descriptive statistics and the correlation matrix. The descriptive statistics of the variables in logarithm form and liner form and the correlation matrix is described below. A sample of 29 Ethiopian agricultural expert commodities for the period 2000 – 2020 were employed.

**Table 3 Descriptive Statistics of the study variable**

<b>Variable</b>	<b>Mean</b>	<b>Std. Dev</b>	<b>Min</b>	<b>Max</b>
lnExport	7.036977	2.860232	0	13.91481
lnER	2.655674	.4796936	2.106237	3.553265
lnGDP	10.54666	.5630557	9.720203	11.42144
lnLF	17.49425	.202993	17.163631	17.80357
lnCPI	3.722131	.8098999	2.688794	5.169427
lnFDI	27.35856	3.241392	18.72079	35.72357
lnGDS	8.720846	.8446126	7.237962	9.80168
lnRoad	11.09896	.5607026	10.40035	11.95118
lnITR	10.23796	1.322694	8.194946	12.0966
TON	.3624984	.2022243	.0004074	.7435785
CI	33.36083	5.204527	23.41463	40.86538

Source: Author's Computation using Stata13 (2022)

Given that the mean values obtained are all in the middle of the maximum and lowest values, they are good measurements of central tendency. Export has an annual growth rate of about US\$ 7.03, with the greatest and lowest numbers being 0 and US\$ 13.91, respectively. Exchange rate has a mean growth rate of 2.65 and a minimum growth rate of 2.1 and a maximum growth rate of 3.553. Economic growth under the study has a mean value of 10.546 with a minimum value of 9.720 and a maximum value of 11.42. The other variable afforce force has mean of growth rate of 17.49%. consumer price index in natural logarithm has a mean of 3.722%. Foreign direct investment has mean value of growth rate 27.38%. On an average the country foreign direct investment for the given period was good and attractive in the country.

### Panel unit root test

Panel Unit Root Tests Panel unit root testing emerged from time series unit root testing. The major difference to time series testing of unit roots is that we have to consider asymptotic behavior of the time-series dimension T and the cross-sectional dimension N. Using Stata we can implement a variety of tests for unit roots or stationarity in panel datasets with the command xtunitroot. The

Levin– Lin–Chu (2002), Harris–Tzavalis (1999), Breitung (2000; Breitung and Das 2005), Im–Pesaran– Shin (2003), and Fisher-type (Choi 2001) tests have as the null hypothesis that all the panels contain a unit root. The Hadri (2000) Lagrange multiplier (LM) test has as the null hypothesis that all the panels are (trend) stationary.

**Table 4: Testing for Unit Roots in Panel Data**

Ho: panel data has unit root(not stationary) Ha: panel data has not unit root (stationary)			
Variables	Summary statistics	P value	Test for unit root in level
<b>lnER</b>	-19.6046	0.000	I(0)
<b>lnGDP</b>	-12.4561	0.000	I(1)
<b>lnLF</b>	-29.8613	0.000	I(1)
<b>lnCPI</b>	-11.6668	0.000	I(1)
<b>lnFDI</b>	-15.9676	0.000	I(0)
<b>lnGDS</b>	-13.0469	0.000	I(1)
<b>lnRoad</b>	-8.2519	0.000	I(1)
<b>lnITR</b>	-4.5818	0.000	I(0)
<b>TON</b>	-29.5042	0.000	I(1)
<b>CI</b>	-19.5071	0.000	I(0)
<b>lnExport</b>	-16.1538	0.000	I(0)

Source: Author’s Computation using Stata13 (2022)

According to the above table result, we reject the null hypothesis and conclude that the variables are almost all stationary. Exchange rate, foreign direct investment, indirect tax revenue, corruption index and agricultural export were stationery at level while the remaining variable like GDP, labor force, consumer price index, gross domestic saving, road network and Terms of trade were stationery at first difference.

## **Determinants of Agricultural Commodity Export**

Looking at our results displayed below in Table 4.3, the dynamic model estimation with predetermined variables has been implemented by applying a 1-step system GMM and 2-step system GMM. The researcher has chosen the one-step system GMM because it has a lower bias and higher efficiency than all the other estimators, including the standard first-differences GMM estimator (Blundell et al., 2001; Hayakawa, 2007; Kukenova & Monteiro, 2008; Hayakawa & Qi, 2020). Within this strategy, the first step to be considered is to identify the appropriate instruments for period t in the equations. Generally, a crucial assumption for the validity of GMM is that the instruments are exogenous. From the result below, the Hansen J test shows a case of no over-identifying restrictions. This suggests that the model seems to be valid in the present context. The



AR (1) term is found to be significant with a p-value of 0.000 whereas AR (2) term is found to be insignificant with a p-value of 0.770. This implies the presence of a negative first-order autocorrelation though does not imply inconsistency in the results.

Equations (3.6) is estimated by the technique of generalized method of moments. For the sake of comparison, we fit the models using one-step (two-stage least squares) and two-step (optimal) GMM estimators with robust standard errors. Table 5 presents the estimation results, where estimation outputs reveal that the one-step and two-step results are slightly different.

Table 5 shows all variables are significant factors that determine Ethiopia's agricultural commodity export. From this determining factors lag of agricultural export, economic growth (lnRGDP), Foreign Direct Invest (lnFDI) and Terms of Trade (TOT) have positive and significant effect on Agricultural commodity export at one step system GMM. Whereas the remaining variables exchange rate (lnER), labor force (lnLF), Gross Domestic Saving (lnGDS), Road (lnROad), indirect tax revenue (lnITR), consumer price index (lnCPI) and corruption index (CI) have significant and negative effect on agricultural export.

The coefficient of lagged agricultural export is positive and statistically significant at the 5% level, indicating an autoregressive nature of export flows. The implication is that a large number of exports to trade partners in the preceding year would create a better relationship and improve the future performance of the country's export. Since the lagged variable has a considerable impact on the dependent variable, we suspect that dynamic specification of the agricultural export overwhelms the static counterparts. Based on the one-step results, for instance, a one percent increase in export level of the previous year boosts current export of each agricultural commodity by about 0.0034%, *ceteris paribus*. Bekele and Mersha (2019) also found that one period lagged value of Ethiopian coffee export has a positive and significant effect on Ethiopian coffee export; Eshetu & Mehare (2020) also investigated that the lagged value of agricultural export has a positive and significant effect on export. In addition, Bantie (2019) investigate that the previous export affects the current export in Ethiopia.

Likewise, economic size (GDP) is found to have a positive significant effect on agricultural export. The concept behind it demonstrates that the higher the economic growth of a nation, the higher the

capacity to exports. In absolute terms, when economic size increases by 1%, other things remain unchanged, the flow of export value of each commodity increased by 6.992%. Kebede (2016), Bantie (2019), Eshet & Mehare (2020) and Alnafissa et al. (2022) also found a positive and significant association between export volume and gross domestic product. In addition, this result is also in line with the prediction of the imperfect substitutes model of international trade and the gravity model.

The other variable, foreign direct investment has positive and significant effect on agricultural export of commodity. Increasing foreign direct investment by 1% resulted in increasing the value of agricultural commodity export by 0.98%, other things being remain constant. With foreign direct investment companies can expand their production operations because they have larger capital and the ability to borrow from international markets, thus benefiting from economies of scale, leading to an increase in exports of a host country. With foreign direct investment companies can expand their production operations because they have larger capital and the ability to borrow from international markets, thus benefiting from economies of scale, leading to an increase in exports of a host country.

The last variable which increases the export value of the agricultural commodities in Ethiopia is a volume of Economic openness). Our result indicated that increased support/higher degree of trade openness would result in higher export expansion. Other things remain constant, increasing trade openness by 1% resulted in increasing the value of an agricultural export commodity by 0.649 percent. The result is confirmed by Zekaria et al. (2019) who investigated that trade openness increased agricultural productivity and indirectly increased (boosts) agricultural export to the rest of the world.

When we come to factors that decrease the value of the agricultural export commodity, the exchange rate has a negative and significant effect on agricultural export. When a country's exchange rate increases relative to another countries, the price of its goods and services increases and imports become cheaper. Ultimately, this can decrease that country's exports and increase imports. This is because exchange rate volatility is negatively associated with trade flows as changes in currency rates are linked to uncertainty (Vo et al., 2019). Exchange rate volatility can harm export trade, directly through uncertainty and adjustment costs, and indirectly through its

effect on the allocation of resources and government policies. Elgali and Mustafa (2012) found that exchange rate volatility harmed developing country exporters' agricultural trade.

When we come to the second determining factor of an agricultural export commodity in Ethiopia, the labor force growth rate has a surprisingly significant and negative effect on the agricultural export of Ethiopia. The result implies that the country is not benefiting from its abundant labor force in raising the production of agricultural exports. A study conducted by (Boansi et' al, 2014) also found a similar result. Although human capital is crucial for economic growth in Africa(Gilbert et al., 2013; Siaw et al., 2018), the negative effect of the labor force on the growth potential of agricultural export is suggestive that human capital development due to education, skills and training, and better health facilities for the poor in Africa and improved the export of agricultural sector. However, in the case of Ethiopia, the labor force has in turn affected the agricultural export sector as the labor growth is dominated by the unemployed labor force and resulting in increasing the domestic consumption of the agricultural product and decreasing the export of agricultural commodities.

Domestic Saving hurts agricultural commodity export in Ethiopia. Other things remain constant, increasing the domestic saving by 1% resulting in a decrease in the agricultural export commodity by 0.6338%. The reason for this is the overall domestic saving may come from the corporate sector. It may both have a larger propensity to save and be more readily taxable and at higher rates than other sectors. If therefore overvaluation leads to the relative expansion of those production sectors that have a larger incidence of the corporate sector within them, the net result could be to increase corporate, and hence total, saving. Thus it is perfectly possible in a developing country of the Salter-Pearce variety (with exportable, importable, and non-traded goods) that the incidence of the corporate sector is highest in the importable sector because non-traded goods are services and the exportable are agricultural goods produced in the traditional organizational molds, or highest in the exportable sector because it is characterized by plantations that are virtually corporations (as in Maize's' Malayan example) whereas the importable sector has smaller sized concerns and the non-traded sector consists of services. Thus, even if one assumes that the non-traded sector has the least incidence of the corporate form of organization, an overvalued exchange rate, as under the managed floating exchange control regime, which (under suitable restrictions) leads to a relative expansion of the importable and reduction of the exportable sector, may be associated with a

change in either direction in the average propensity to save and in the tax revenue gathered. Yet another link between the foreign trade regime and the saving performance of the economy may be asserted in the form of the impact of the regime on the relative sizes of the urban and the rural sectors. Given these arguments, it would appear that overvaluation could lead to more saving by relatively expanding the importable sector and inhibiting the growth of the exportable sector, thus increasing incomes in the urban and depressing them in the rural sector if the average propensity to save and the taxability in the urban sector was higher than in the rural sector. As the most of gross domestic savings in Ethiopia are arising from the urban sectors, it has the greatest probability that increasing total domestic savings resulted in decreasing the total agricultural export commodity.

Infrastructure on the road network had a negative and significant effect on the agricultural export commodity. Other things remaining constant, increasing the road network by 1% resulted in decreasing the value of agricultural export by 1.14% in the country. This result indicated that increasing the road network decreased the price of agricultural commodities and resulted in a decrease in the value of agricultural export commodities even though it has a potential effect on increasing the volume of agricultural export. The result supports Bond's (2006) hypothesis about the potentially detrimental effects of transport infrastructure on other countries through the terms of trade. The other possible justification is that the higher domestic price may either encourage exporters to sell their products at local markets or discourage importers of the products and will lead to lower exports of an agricultural commodity to the rest of the world.

Indirect tax revenue had a significant and negative effect on agricultural commodity export in Ethiopia. An indirect tax is a tax imposed by the government that increases the supply costs of producers. Therefore the imposition of indirect tax revenue on the producer of agricultural suppliers resulted in a decrease in the agricultural export value of the commodity. A ban or a tax on exports implemented by a large country depresses the domestic price of the taxed commodity, increases the international price, and reduces the volume of trade. Other things remain constant, increasing the indirect tax revenue by 1% resulted in a -0.39 percent decrease in the agricultural commodity export. Efficiency losses stem from distortions caused by the export tax, affecting both producers and consumers. Production distortions result from the fact that too little is produced in the exporting country, while too much is produced in the importing country. On the one hand,

a tax on exports discourages efficient local producers in the exporting country. On the other hand, it leads foreign producers in the importing country to produce locally what consumers could purchase more cheaply abroad. Consumption distortions result from the fact that too much of the taxed good is consumed domestically, because of the reduced domestic price.

The last determining factor is the corruption index, corruption index has a negative and significant effect on agricultural commodity export. For every 1% increase in the corruption index, agricultural commodity export value tends to fall by 0.072%, *ceteris paribus*. Corruption is stated as the abuse of entrusted power for private gain, and the existence of corruption depends on three elements, which are benefits, abuse of power, and the private-public sector. Corruption is mostly linked with the organizational structure of a state in terms of economic and managerial. It is seen as a basic impediment to governmental efficiency. Indeed, the private sector or governments can be conceived as a symptom that something has gone wrong in the management of the state. Advice on sound policies, well-designed incentives, and efforts may not reach the desired results when the corruption starts and grows.

**Table 5: Regression Result of Agriculture Export Commodity determinants**

Dependent variable: Natural logarithm of the total agricultural export commodities					
Regressors		One step system GMM result		Two step system GMM	
		Coefficients	P- value	Coefficients	p-value
ln(lag agricultural export)		0.0034***	0.000	0.001	0.119
ln(ER <sub>t</sub> )		-2.116***	0.000	-1.263 ***	0.006
ln(GDP <sub>t</sub> )		6.922***	0.000	4.207	0.226
ln(LF <sub>t</sub> )		-15.95***	0.000	-2.585	0.814
ln(CPI <sub>ij</sub> )		-1.487***	0.000	-1.458**	0.031
ln(FDI <sub>t</sub> )		1.45***	0.000	0.997***	0.000
ln(GDS)		-0.633***	0.000	0.057	0.847
ln(road)		-1.147***	0.000	-1.130	0.398
ln(ITR)		-0.390***	0.000	-2.102*	0.072
TOT		0.649***	0.000	1.233*	0.097
CI		-0.072***	0.000	-0.038	0.294
Constant		205.15**	0.000	12.90	0.933
Hansen Test of	chi2(353) =33.88			Pr > chi2 = 0.330	
Overid. Restrictions					
Arellano-Bond Test	AR(1): z = -9.07			Pr > z = 0.000	
for Autocorrelation	AR(2): z = -0.29			Pr > z =0.770	
No of observation	29 Agricultural commodities Countries*21 years = 609 Observations				

## **CHAPTER FIVE: CONCLUSION AND POLICY RECOMMENDATIONS**

### **5.1 Conclusion**

The agriculture sector, which accounts for more than 43% of the country's GDP, 83.9% of foreign currency earnings, and employs a large portion of the population, with more than 80% of the population employed in it for the past 20 years, is the key sector to which the fluctuation in export earnings can be attributed.

The fact that Ethiopia has a large plot of uncultivated agricultural land that is still fertile and productive, the fact that more than half of the population can be considered an active labor force, with more than 45 million people according to recent population censuses, and the fact that Ethiopia has favorable agro-ecological characteristics for intensive agricultural production, all help the country to have a comparative advantage in production and export. By concentrating on this sector, the economy will not only be able to close the trade deficit the country is faced with, but it will also be able to break free from its subsistence production features in general, and strengthen the agriculture sector in particular.

The agricultural sector's contribution to the country's overall export earnings, agricultural export items including coffee, oilseeds, pulses, flowers, and fruits and vegetables aggregated in 2019/20 exported 1.25 billion metric tons which take 95.5% share of the total country's export volume (NBE, 2019/20). Export volume from the agricultural sector, is relatively stable with a progressive growth trend and where the total export volume is highly dependent on the agricultural sector. As a country aiming to achieve middle income economy by 2025 having a significant portion of its population directly engaged in agriculture, understanding the main constraints in agricultural products value-chain and the key variables manipulating its international market position is of paramount importance for any development studies including this study.

The first objective of this study is to understand the overall agricultural export fluctuations trend. The central question investigated in this paper was whether the supply side or the external/demand-side factors significantly determine the agricultural export of Ethiopia. Based on the analysis and findings the study provides recommendations on how to remedy the negative determinants and further strengthen the positive determinants and provide policy recommendations.

The descriptive results revealed that the export sector of Ethiopia is still dominated by a few primary, price, and income inelastic agricultural commodities, where coffee, oilseeds, and pulse alone account for more than 50% of the export earnings of the country and are vulnerable to internal and external shocks. The selected 29 agricultural export items constituted more than 80% of the total export value of the country.

The agricultural export sector suffers from a multitude of institutional and systematic bottlenecks including cumbersome custom procedures, limited market information (international quality standards, product marketing), poor product standards and volume capacity, limited/unavailability of trade logistics services (storage and transportation), lack of trade finances and loose and inconsistent quality regulation framework and supervision. By causing time delays, sub-standardized quality products and volume and incurring additional cost these bottlenecks have had a significant impact on the volume and quality of agricultural products that are being exported out of the country and also the future potential of the sector.

The second objective of the study is to identify and understand the rational/determinants factors using panel data of key commodities across a period of time. Based on intensive literature reviews conducted including theoretical and empirical studies, the study identified Real Gross Domestic Product (RGDP), exchange rate (ER), consumer price index (CPI), labor force, total road network coverage (RNC), corruption index (CI), net inflow of foreign direct investment (FDI), indirect tax revenue (ITR), total domestic saving (RGDS), and terms of trade index of exports which is a measure of trade openness (ToT) as the main independent variables.

These independent variables were regressed by applying two logarithms functions on value and volume of a panel data of 29 major agricultural export commodities for period of 21 years (2000 – 2021). The study collected secondary data from various government and international organizations) and utilized both descriptive and econometric models to analyze the data.

After defining the model, the Fisher panel unit root test was conducted and the null hypothesis rejected whereby the independent variables were found to be almost all stationary. The dynamic model estimation with the one-step system GMM was selected and applied due to its lower bias and higher efficiency. The Hansen J test was conducted and presented no over-identifying restrictions suggesting the model's validity to the study and present context.



Using the natural logarithm of agricultural export value of each commodity, and the selected the demand and supply side determinant factors of agricultural export of the commodity-like lag of agricultural export commodity, RGDP, exchange rate, consumer price index, labor force, total road network coverage, corruption index, foreign direct investment, indirect tax revenue, total domestic saving, and trade openness, the result showed that all variables were significant factors that impact Ethiopia's agricultural commodity export. From these determining factors lag of agricultural export, economic growth (lnRGDP), Foreign Direct Invest (lnFDI), and Terms of Trade (TOT) have a positive and significant effect on agricultural commodity export at one-step system GMM. Whereas the remaining variables are exchange rate (lnER), labor force (lnLF), Gross Domestic Saving (lnGDS), Road (lnROad), indirect tax revenue (lnITR), consumer price index (lnCPI), and corruption index (CI) have a significant and negative effect on agricultural export.

As a result, lowering corruption and indirect tax on export, and poor quality of the road, gross domestic saving which hinders the agriculture sector (lack of agriculture financing) will motivate private investment in the export sector. Besides, controlling rapid population growth would decrease domestic consumption of exportable commodities and would increase export surplus. Finally, directing foreign direct investment to the agricultural sector will also increase Ethiopian agricultural exports. Future researchers may assess the association between political instability and Ethiopian agricultural exports.

## 5.2 Recommendations

The study found that export performance of agricultural products is dependent on several internal and external variables, holding other factors constant. Based on the result and discussion above the following recommendations are made:

- Considering the strong relationship between improved export performance and its positive implication on economic growth, the data gathered in this research suggests that Ethiopia should identify the important factors that directly and indirectly determine the country's export performance. There is strong evidence that suggest positive and significant coefficients of the production capacity, denoted by real GDP, coupled with macroeconomic policy reforms aimed at improving the growth of real GDP as having strong correlation to enhanced total export supply of agricultural commodity export to the rest of the world.
- In order to increase the impact of agricultural export on economic growth, a concerted effort should be directed towards productive channels of agricultural commodity in the economy so as to enhance sustainable economic growth through increased agricultural commodity export. Modern production systems must be quickly introduced to upgrade the traditional methods of agricultural farming and encouraging large commercial farms through the provision of agricultural growth opportunities and enforcing the implementation of different export incentives available for exporters in the sector. Emphasis of the government should be directed towards value addition rather than exporting raw agricultural commodity.
- The agricultural export sector suffers from a multitude of institutional and systematic bottlenecks including cumbersome custom procedures, limited market information (international quality standards, product marketing), poor product standards and volume capacity, limited/unavailability of trade logistics services (storage and transportation), lack of trade finances and loose and inconsistent quality regulation framework and supervision. As most of the challenges identified in this study are focused on institutional and systematic bottlenecks, the recommendations derived thereof reflect the same. The study has found that the revision and introduction of institutional frameworks needed for an improved coordination and efficient alignment in procedure would require that various regulatory institutions that focus on agricultural exports need to put in place the proper human

resource, knowledge, and skill capabilities to enable them conduct key services competently, resourcefully and in a targeted manner. Alignment amongst key institutions can lead to efficient decision making amongst regulatory institutions, consistent quality supervision, targeted interventions through various actors, and improved efficiency in service provision.

- Based on the econometric result derived in this study, findings indicate improvement of business enabling environment through key indicators such as lowering of corruption, indirect tax on exports, and improvement of key infrastructures will attract and motivate both domestic and foreign private investments in the agricultural export sector. Therefore, positive efforts in both in policy, strategic interventions and development of key infrastructure should be directed towards lowering corruption and indirect tax on export, enhancing quality of roads, and improving gross domestic saving focused towards motivating private investment in the export sector.
- The study indicates that there is a positive relation between economic growth, FDI and terms of trade (ToT), and performance of agricultural products export. It would therefore be advantageous to exporters to be informed of international prices, develop exporters agreements for a sustained demand, develop and rollout a marketing plan to introduce agricultural products to the international market which would boost the presence and demand of the Ethiopian agricultural export products.

## REFERENCES

- Abate, T., Shiferaw, B., Gebeyehu, S., Amsalu, B., Negash, K., Assefa, K., ... & Hagmann, J. (2011). A systems and partnership approach to agricultural research for development: Lessons from Ethiopia. *Outlook on agriculture*, 40(3), 213-220.
- Abay, A. (2010). *Market chain analysis of red pepper: the case of Bure woreda, west Gojjam zone, Amhara National Regional State, Ethiopia* (Doctoral dissertation, Haramaya University).
- Abolagba, E. O., Onyekwere, N. C., Agbonkpolor, B. N., & Umar, H. Y. (2010). Determinants of agricultural exports. *Journal of Human Ecology*, 29(3), 181-184.
- Agasha Nimrod(2006), Determinants of Export Growth Rate in Uganda 1987- 2006
- Ahmed, O., & Sallam, W. (2018). Studying the volatility effect of agricultural exports on agriculture share of GDP: The case of Egypt. *African Journal of Agricultural Research*, 13(8), 345-352.
- Aklilu, Y. (2008). Livestock marketing in Kenya and Ethiopia: a review of policies and practice. Feinstein International Center, Addis Ababa, 38.
- Allaro, H. B. (2015). Export performance of oilseed and its determinants in Ethiopia. *Journal of Cereals and Oilseeds*, 2(1), 1–15. <https://doi.org/10.5923/j.economics.20110101.01>.
- Alnafissa, M., Abdeen, M., Bashir, K., Alamri, Y., Alagsam, F., & Al-Duwais, A. (2022). Impact of Gulf Cooperation Countries' Foreign Direct Investment on Sudan's Agricultural Exports. *Sustainability*, 14(6), 3542.
- Amoro, G., & Shen, Y. (2013). The determinants of agricultural export: Cocoa and rubber in Cote d'Ivoire. *International Journal of Economics and Finance*, 5(1), 228-233.
- Angrist, N., Goldberg, P. K., & Jolliffe, D. (2021). Why Is Growth in Developing Countries So Hard to Measure? *Journal of Economic Perspectives*, 35(3), 215-42.
- Arellano, M., & Bond, S. (1991). Some Tests of Specification for Panel Data: Monte Carlo Evidence and Application to Employment Equations. *The Review of Economic Studies*, 58(2), : 277-297.
- Armington, P. (1969). A theory of demand for products distinguished by place of production. IMF Staff Papers, 16(3), 159-176.
- Awulachew, S. B. (2019). Irrigation potential in Ethiopia: Constraints and opportunities for enhancing the system. *Gates Open Res*, 3(22), 22.
- Baker, M. M., & Yuya, B. A. (2020). Determinant of Sesame Export Performance in Ethiopia: A Panel Gravity Model Application. *Turkish Journal of Agriculture-Food Science and Technology*, 8(3), 714-720.
- Baldwin, R.E. & Murray, T. (1977). MFN tariff reductions and developing country trade under the GSP. *Economic Journal*, 87(345), 30-46.
- Baltagi, B. H. (2005). *Econometrics Analysis of Panel Data*.

- Bantie, Lewoye. (2019). Determinants and Potentials of Foreign trade of Ethiopia by using a dynamic gravity model approach using a dynamic panel data model. 10.13140/RG.2.2.12347.85286.
- Barrett, C., Reardon, T., Swinnen, J., & Zilberman, D. (2019). Structural transformation and economic development: insights from the agri-food value chain revolution. *Cornell University*.
- Batra, A. (2014). India's Global Trade Potential: The Gravity Model Approach. *ICRIER Working Paper*.
- Bekele, W. T., & Mersha, F. G. (2019). A dynamic panel gravity model application on the determinant factors of Ethiopia's coffee export performance. *Annals of Data Science*, 6(4), 787–806.
- Bekena, N., & Greiling, J. (2017). Quality focused apiculture sector value chain development in Ethiopia. *J. Agric. Sci. Technol. A*, 7, 107-116.
- Bergstrand, J. (1985). The gravity Equation in International Trade: Some Microeconomic Foundations and Empirical Evidence. *Review of Economics and Statistics*.
- Belayneh and wondaferahu(2013). Determinants of export performance in Ethiopia, VAR model analysis
- Bereket, I. (2020). The determinate of agricultural export in Ethiopia: An error correction model and Co-integration approach. *Journal of Economics and Sustainable Development*, 11(3), 51–57. <https://doi.org/10.7176/JESD/11-3-05>.
- Blundell, R., Bond, S., & Windmeijer, F. (2001). *Estimation in dynamic panel data models: improving on the performance of the standard GMM estimator*. Emerald Group Publishing Limited.
- Boansi, D., Odilon, B., Lokonon, K., & Appah, J. (2014). Determinants of agricultural export trade: Case of fresh pineapple exports from Ghana. *British Journal of Economics, Management & Trade*, 4(11), 1736–1754.
- Bond, Eric W. (2006), Transportation infrastructure investments and trade liberalization, *Japanese Economic Review* 57, 483-500.
- Bowsher, C. (2002). On Testing Overidentifying Restrictions in Dynamic Panel Data Models. *Economics Letters*, 211-220.
- Boyd, C. E., D'Abramo, L. R., Glencross, B. D., Huyben, D. C., Juarez, L. M., Lockwood, G. S., ... & Valenti, W. C. (2020). Achieving sustainable aquaculture: Historical and current perspectives and future needs and challenges. *Journal of the World Aquaculture Society*, 51(3), 578-633.
- Busch, L. M., & Lacy, W. B. (2019). *Science, agriculture, and the politics of research*. Routledge.

- Bulcha, M. (1988). Flight and integration: Causes of mass exodus from Ethiopia and problems of integration in the Sudan. Nordic Africa Institute.
- Cameron, A., & Trivedi, P. K. (2005). *Microeconometrics Methods and Applications*. Cambridge: Cambridge University Press.
- Carbaugh, R. (2011). International economics. South-Western Cengage Learning
- Chakraborty, D. (2009). Contract farming in India: Unique solution to multilayer agricultural problems? *Review of Market Integration*, 1(1), 83-102.
- Cheffo, A. (2020). Export performance of spice crops and its determinants in Ethiopia: VECM analysis. *Journal of Economics and Sustainable Development*, 11(3), 58–67. <https://doi.org/10.7176/JESD/11-3-06>.
- Couharde, C., Delatte, A. L., Grekou, C., Mignon, V., & Morvillier, F. (2018). Eqchange: A world database on actual and equilibrium effective exchange rates. *International economics*, 156, 206-230.
- Das, D. K. (2016). Determinants of current account imbalance in the global economy: a dynamic panel analysis. *Journal of Economic Structures*, 5(1), 1-24.
- Davis, K., Swanson, B., Amudavi, D., Mekonnen, D. A., Flohrs, A., Riese, J., ... & Zerfu, E. (2010). In-depth assessment of the public agricultural extension system of Ethiopia and recommendations for improvement. *International Food Policy Research Institute (IFPRI) Discussion Paper*, 1041, 193-201.
- Diriba, G. (2018). Agricultural and rural transformation in Ethiopia. *Ethiopian Journal of Economics*, 27(2), 51-110.
- Dube, A. K., Ozkan, B., & Govindasamy, R. (2018). Analyzing the export performance of the horticultural sub-sector in Ethiopia: ARDL bound test cointegration analysis. *Horticulturae*, 4(4), 34.
- Drukker, D. (2008). *Econometric Analysis of Dynamic Panel Data Models Using Stata*.
- Elgali, M. B. & Mustafa, R. H. (2012). The impact of overvalued exchange rate policy on agricultural trade in Sudan. Proceedings of the Third RUFORUM Biennia, Uganda.
- Emran, M. S., & Stiglitz, J. E. (2005). On selective indirect tax reform in developing countries. *Journal of public Economics*, 89(4), 599-623.
- Enquobahrie, A. (2006). Some controversies on informal sector operation in Ethiopia: Problems and prospects for a development strategy.
- Fleming, J. M. (1962). Domestic financial policies under fixed and under floating exchange rates. *Staff Papers*, 9(3), 369–380
- Francois, J.F. & Hall, H.K. (1997). Partial equilibrium modeling. In Francois, J.F. & Reinert, K.A. (Eds.), *Applied methods for trade policy analysis: A handbook* (pp. 122-155). Cambridge: Cambridge University Press.

- Francois, J.F. & Reinert, K.A. (2009). Partial equilibrium models. In Reinert, K.A., Rajan, R.S., Glass, A.J. and Davis, L.S. (Eds.), *The Princeton Encyclopedia of the World Economy* (pp. 891-894). Princeton: Princeton University Press.
- Frees, E. W. (2004). *Longitudinal and panel data: analysis and applications in the social sciences*. Cambridge University Press.
- Filassi, M., de Oliveira, A. L. R., Elias, A. A., & Marsola, K. B. (2021). Analyzing complexities in the Brazilian soybean supply chain: a systems thinking and modeling approach. *RAUSP Management Journal*.
- Fugazza, M. (2004), “Export Performance and Its Determinants: Supply and Demand Constraints”, Policy Issues in International Trade and Commodities Study Series No. 2
- Furtan, W. H., & Holzman, J. J. (2004). *The Effect of FDI on Agriculture and Food Trade: An Empirical Analysis 1987-2001* (No. 1391-2016-117071).
- Gashaw, B. A., & Kibret, S. M. (2018). The role of Ethiopian commodity exchange (ECX) in crop value chain development in Ethiopia. *Int J Bus Econ Res*, 7, 183.
- Gbetnkom, D., & Khan, S. A. (2020). *Determinants of agricultural exports: The case of Cameroon* (Doctoral dissertation, AERC).
- Gebrehiwot, G., & Gebru, B. (2015). Ethiopia’s foreign trade potential: Inferences from a dynamic gravity approach. *International Journal of Economics and Business Research*, 9(4), 355–375. <https://doi.org/10.1504/IJEER.2015.069667>.
- Gebregziabher, F. H. (2019). The exchange rate: Why it matters for structural transformation and growth in Ethiopia. *World Bank Policy Research Working Paper*, (8868).
- Gebreselassie, S., Haile, M., & KALKUHL, M. (2017). The wheat sector in Ethiopia: Current status and key challenges for future value chain development.
- Geda, A., & Seid, E. H. (2015). The potential for internal trade and regional integration in Africa. *Journal of African Trade*, 2(2), 19–50.
- Getnet, K., & Anullo, T. (2012). Agricultural cooperatives and rural livelihoods: Evidence from Ethiopia. *Annals of public and cooperative Economics*, 83(2), 181-198.
- Gizaw, N., Abafita, J., & Merra, T. M. (2022). Impact of coffee exports on economic growth in Ethiopia; An empirical investigation. *Cogent Economics & Finance*, 10(1), 2041260.
- Girma, A., Lemma, T., & Puskur, R. (2009). Towards pluralistic livestock service delivery system for the commercialization of smallholder livestock agriculture in Ethiopia: Evidence from smallholder dairying in Debrezeit milkshed.
- Goldstein, M., & Khan, M. S. (1978). The supply and demand for exports: A simultaneous approach. *Review of Economics and Statistics*, 60, 275–286.
- Goldstein, P. (2020). Pathways for Productive Diversification in Ethiopia.
- Grosse R. and Trevino L.J (1996) Foreign Direct investment in the united states an analysis by country of origin, *Journal of international business studies* Vol 127 PP139-155.

- Gupta, M., & Varshney, S. (2021). Exchange rate volatility and India-US export at commodity level: evidence from an autoregressive distributed lag approach. *Iranian Economic Review*.
- Gururaj, B., Satishkumar, M., & Kumar, A. (2016). Analysis of factors affecting the performance of exports in India. *International Journal of Agriculture, Environment and Biotechnology*, 9(4), 613–616.
- Haitho, N. (2013). Determinants of Vietnam’s exports: A gravity model approach [Master’s thesis]. Martin De Tours School of Management and Economics, University of Bangkok, Thailand.
- Hayakawa, K. (2007). Small sample bias properties of the system GMM estimator in dynamic panel data models. *economics Letters*, 95(1), 32-38.
- Hayakawa, K., & Qi, M. (2020). Further results on the weak instruments problem of the system GMM estimator in dynamic panel data models. *Oxford Bulletin of Economics and Statistics*, 82(2), 453-481.
- Heckscher, E. (1919). The effect of foreign trade on the distribution of income. *Ekonomisk Tidskrift*, 13, 497–512.
- Hors Mann I,J and Markusen J.R (1992) Endogenous market structures in international trade, *Journal of international economics*, Vol32 PP 109-129.
- Hossain, M. S., & Mitra, R. (2013). A Dynamic Panel Analysis of the Determinants of FDI in Africa. *Economics Bulletin*, 33(2), 1606-1614.
- Hsiao, C. (2007). Panel data analysis—advantages and challenges. *Test*, 16(1), 1-22.
- Kukenova, M., & Monteiro, J. A. (2008). Spatial dynamic panel model and system GMM: A Monte Carlo investigation. *Available at SSRN 1300871*.
- Hutchinson, W. K. (2019). Linguistic distance as a determinant of bilateral trade. *Southern Economic Journal*, 72(1), 1–15.
- Idsardi, E. (2010). *The determinants of agricultural export growth in South Africa* (No. 308-2016-5117).
- Ikpe, E. (2021). Thinking about developmental statehood, manufacturing and international capital: the case of Ethiopia. *Canadian Journal of Development Studies/Revue canadienne d’études du développement*, 1-22
- İpek, İ. (2020). The relevance of international marketing strategy to emerging-market exporting firms: from a systematic review towards a conceptual framework. *International Marketing Review*.
- Kahfi, A. S. (2016). Determinants of Indonesia’s exports of manufactured products: A Panel data analysis. *Buletin Ilmiah Litbang Perdagangan*, 10(2), 187-202.
- Kamp, L. M., & Forn, E. B. (2016). Ethiopia’s emerging domestic biogas sector: Current status, bottlenecks and drivers. *Renewable and Sustainable Energy Reviews*, 60, 475-488.



- Karagöz, K. (2015). Determining factors of Turkey's export performance: An empirical analysis. *Procedia Economics and Finance*, 38, 446–457.
- Karamuriro, H. T., & Karukuza, W. N. (2015). Determinants of Uganda's export performance. *International Journal of Business and Economics Research*, 4(2), 45–54.
- Kebede, A. (2016). Determinants and potentials of foreign trade in Ethiopia: A gravity model analysis [No. 74509, 13:19]. Munich Personal RePEc Archive.
- Khurana, A., & Sharma, A. (2016). Goods and Services Tax in India-A positive reform for indirect tax system. *International Journal of Advanced Research*, 4(3), 500-505.
- Kiani, A., Ijaz, F., & Siddique, H. M. A. (2018). Determinants of Agricultural Exports of Pakistan: An Application of Gravity Model. *Dialogue (Pakistan)*, 13(4).
- Krugman, P. (1983). New theories of trade among industrial countries. *American Economic Review*, 73(2), 343–347.
- Krugman, P. R. (2003). In *International Economics: Theory and Policy* (pp. 7-13). Boston San Francisco New York : Pearson Education, Inc.
- Lillo, R. L., & Torrecillas, C. (2018). Estimating dynamic Panel data. A practical approach to perform long panels. *Revista Colombiana de Estadística*, 41(1), 31-52.
- Linder, S. (1961). *An essay on trade and transformation*. Wiley.
- Liu, J., Wang, M., Yang, L., Rahman, S., & Sriboonchitta, S. (2020). Agricultural productivity growth and its determinants in the south and southeast Asian countries. *Sustainability*, 12(12), 4981.
- Liu, Y., & Wang, X. (2022). Promoting competitiveness of green brand of agricultural products based on agricultural industry cluster. *Wireless Communications and Mobile Computing*, 2022.
- Majeed, M. T., Ahmad, E., & Khawaja, M. I. (2006). Determinants of exports in developing countries [with comments]. *The Pakistan Development Review*, 1265-1276.
- Maraveas, C. (2020). Production of sustainable and biodegradable polymers from agricultural waste. *Polymers*, 12(5), 1127.
- Marinoudi, V., Sørensen, C. G., Pearson, S., & Bochtis, D. (2019). Robotics and labour in agriculture. A context consideration. *Biosystems Engineering*, 184, 111-121.
- Matthess, M., & Kunkel, S. (2020). Structural change and digitalization in developing countries: Conceptually linking the two transformations. *Technology in society*, 63, 101428.
- Mengistu, A. A. (2014). Ethiopia's export performance with major trade partners: A gravity model approach. *Journal of Natural Sciences Research*, 4(20), 21–28.
- Miah, M. M., & Majumder, S. C. (2020). An Empirical Investigation of the Impact of FDI, Export and Gross Domestic Savings on the Economic Growth in Bangladesh. *The Economics and Finance Letters*, 7(2), 255-267.

- Mundell, R. A. (1963). Capital mobility and stabilization policy under fixed and flexible exchange rates. *Canadian Journal of Economics and Political Science/Revue canadienne de economiques et science politique*, 29(4), 475–485.
- Nadeem, M. M., Azam, M., & Islam, R. (2012). An Investigation of the Various Factors Influence on Exports. *Global Journal of Management and Business Research*, 12(19).
- Narayan, S., & Bhattacharya, P. (2019). Relative export competitiveness of agricultural commodities and its determinants: Some evidence from India. *World Development*, 117, 29–47. <https://doi.org/10.1016/j.worlddev.2018.12.013>.
- Nasrullah, M., Chang, L., Khan, K., Rizwanullah, M., Zulfiqar, F., & Ishfaq, M. (2020). Determinants of forest product group trade by gravity model approach: A case study of China. *Forest Policy and Economics*, 113, 102117.
- NBE. (2018). Annual Report on the Ethiopian Economy. National Bank of Ethiopia.
- Negera, D. G. (2015). Analysis of factors determining the supply of Ethiopian cardamom spice (*Aframomum corrorima*): a case from Bench Maji zone of SNNPR, Ethiopia. *European Journal of Business and Management*, 7(1), 56-63.
- Nguyen, V. C., & Do, T. T. (2020). Impact of exchange rate shocks, inward FDI and import on export performance: a cointegration analysis. *The Journal of Asian Finance, Economics and Business*, 7(4), 163-171.
- Olper, A. (2001). Determinants of agricultural protection: The role of democracy and institutional setting Alessandro Olper. *Journal of Agricultural Economics*, 52(2), 75-92.
- Osabohien, R., Iqbal, B. A., Osabuohien, E. S., Khan, M. K., & Nguyen, D. P. (2021). Agricultural trade, foreign direct investment and inclusive growth in developing countries: evidence from West Africa. *Transnational Corporations Review*, 1-12.
- Ozdemir, D. (2017). Causal Relationship between Agricultural Exports and Exchange Rate: Evidence for India. *Applied Economics and Finance*, 4(6), 36-41.
- Parker, S. (2020). Panel Data Econometrics: Common Factor Analysis for Empirical Researchers.
- Petrikova, I. (2019). Food-security governance in India and Ethiopia: A comparative analysis. *Third World Quarterly*, 40(4), 743-762.
- Qiu, Z., Egidi, E., Liu, H., Kaur, S., & Singh, B. K. (2019). New frontiers in agriculture productivity: Optimised microbial inoculants and in situ microbiome engineering. *Biotechnology advances*, 37(6), 107371.
- Rahman, M. M. (2009). The determinants of Bangladesh's imports: A gravity model analysis under panel data. . *In Australian Conference of Economists*.
- Ram, Y., & Prasad, B. C. (2007). Assessing Fiji's global trade potential using the Gravity Model approach.
- Ricardo, D. (1951). The works and correspondence of David Ricardo (Piero Sraffa and M. H. Dobb, Eds.). Cambridge University Press.

- Reinert, E. S. (2020). *Industrial policy: A long-term perspective and overview of theoretical arguments*. Working Paper WP 2020-04, UCL Institute for Innovation and Public Purpose.
- Reinert, K.A. & Roland-Holst, D.W. (1992). Armington elasticities for United States manufacturing sectors. *Journal of Policy Modeling*, 14(5), 631-639.
- Roodman, D. (2006). How to do Xtabond2: An Introduction to Difference and System GMM in Stata. *Working Paper No. 103, Center for Global Development*.
- Salvatore, D. (2013). In *International Economics*. New York: Library of Congress Cataloging.
- Sawore, A. M. (2015). Determinants of export trade in the econometric study with special reference to Ethiopia. *International Journal of Science and Research*, 5(12), 132–137.
- Sertoglu, K., & Dogan, N. (2016). Agricultural trade and its determinants: Evidence from bounds testing approach for Turkey. *International Journal of Economics and Financial Issues*, 6 (2), 450–455.
- Shah, F., & Wu, W. (2019). Soil and crop management strategies to ensure higher crop productivity within sustainable environments. *Sustainability*, 11(5), 1485.
- Shaik, K., & Gona, B. R. (2021). Exchange rate and the economic growth in India: An empirical analysis. *Journal of Public Affairs*, 21(2), e2177.
- Shikur, Z. H. (2020). Agricultural policies, agricultural production and rural households' welfare in Ethiopia. *Journal of Economic Structures*, 9(1), 1-21.
- Siyakiya, P. (2016). An econometric analysis of Zimbabwe's export competitiveness. *Maghreb Review of Economics and Management*, 3, 1–14.
- Smith, A. (1976). *An inquiry into the nature and causes of the wealth of nations*. Oxford University Press.
- Rashid, S. (2015). *Commodity Exchanges and Market Development: What Have we Learned?* (No. 1008-2016-80319).
- Rouslang, D.J. & Suomela, J.W. (1988). Calculating the Welfare Costs of Import Restrictions in the Imperfect Substitutes Model. *Applied Economics* 20:5, 691-700.
- Stata13. (2013). *STATADATA-MANAGEMENT REFERENCEMANUAL RELEASE13, Stata Longitudinal-Data/Panel-Data Reference Manual* . Texas: A stata press Publication .
- Sul, D. (2019). *Panel data econometrics: Common factor analysis for empirical researchers*. Routledge.
- Tadele, E. (2021). Land and heterogenous constraints nexus income diversification strategies in Ethiopia: systematic review. *Agriculture & Food Security*, 10(1), 1-14.
- Tesfaye, E. (2014). Determinants of agricultural export in Sub-Saharan Africa: evidence from a panel study. *American Journal of Trade and Policy*, 1(2), 62-70.

- Thuy, V. N. T., & Thuy, D. T. T. (2019). The impact of exchange rate volatility on exports in Vietnam: A bounds testing approach. *Journal of Risk and Financial Management*, 12(1), 6.
- Tilahun, D. (2007). *Performance of coffee marketing co-operatives and members' satisfaction in Dale District: SNNPRS-Southern Ethiopia* (Doctoral dissertation, Haramaya University).
- Tolcha, P. T. (2020). Khat marketing and its export performance in the Ethiopian economy. *Sci Res*, 8, 90-97.
- Tsionas, M. (Ed.). (2019). *Panel Data Econometrics: Empirical Applications*. Academic Press.
- UNCTAD (2005), "Determinants of Export Performance: Developing Countries in International Trade", Trade and Development Index 2, pp. 49-79.
- Uysal, Ö., & Mohamoud, A. S. (2018). Determinants of export performance in East African countries. *Chinese Business Review*, 17(4), 168-178.
- Yishak, T. (2009). Determinants of Ethiopia's export performance: A gravity model analysis. Trade and Development Discussion Paper, No. 1, BKP. *Development Research and Consulting, Germany*.
- Yoon, J. (2021). Forecasting of real GDP growth using machine learning models: Gradient boosting and random forest approach. *Computational Economics*, 57(1), 247-265.
- Velasco-Muñoz, J. F., Mendoza, J. M. F., Aznar-Sánchez, J. A., & Gallego-Schmid, A. (2021). Circular economy implementation in the agricultural sector: Definition, strategies and indicators. *Resources, Conservation and Recycling*, 170, 105618.
- Verbeek, M. (2004). *A guide to Modern Econometrics*. Rotterdam: John Wiley & Sons Ltd.
- Victoria, E., & Samuel, J. (2017). Empirical determinants of agricultural exports in Nigeria. *European Journal of Business and Management*, 9(23), 14-20.
- Vo, D. H., Vo, A. T., & Zhang, Z. (2019). Exchange rate volatility and disaggregated manufacturing exports: Evidence from an emerging country. *Journal of Risk and Financial Management*, 12(1), 12.
- Wang, Y., Xie, L., Zhang, Y., Wang, C., & Yu, K. (2019). Does FDI promote or inhibit the high-quality development of agriculture in China? An agricultural GTFP perspective. *Sustainability*, 11(17), 4620.
- Woldie, G. A., & Siddig, K. (2019). Macroeconomic and distributional impacts of exchange rate devaluation in Ethiopia: A computable general equilibrium approach. *Heliyon*, 5(12), e02984.
- World Bank. (2016). World Bank open data. World Bank Group.
- \_\_\_\_\_.(2020). World Bank open data. World Bank Group.
- \_\_\_\_\_.(2021). World Bank open data. World Bank Group.
- Wooldridge, J. M. (2010). *Econometric analysis of cross-sectional and panel data*. MIT press.

- Zakaria, M., Jun, W., & Khan, M. F. (2019). Impact of financial development on agricultural productivity in South Asia. *Agricultural Economics*, 65(5), 232-239.
- Zeray, N., & Gachen, D. (2014). Determinants of bilateral trade between Ethiopia and its major trading partners: A gravity model approach. *Journal of Economics and Sustainable Development*, 5(15), 82–88.
- Zyphur, M. J., Voelkle, M. C., Tay, L., Allison, P. D., Preacher, K. J., Zhang, Z., ... & Diener, E. (2020). From data to causes II: Comparing approaches to panel data analysis. *Organizational Research Methods*, 23(4), 688-716.



**Table 10: Fisher-type Unit-root test**

Fisher-type unit-root test for lnER Based on augmented Dickey-Fuller tests				Fisher-type unit-root test for lnFDI Based on augmented Dickey-Fuller tests			
Ho: All panels contain unit roots	Number of panels =	21		Ho: All panels contain unit roots	Number of panels =	21	
Ha: At least one panel is stationary	Avg. number of periods =	29.00		Ha: At least one panel is stationary	Avg. number of periods =	29.00	
AR parameter: Panel-specific	Asymptotics: T -> Infinity			AR parameter: Panel-specific	Asymptotics: T -> Infinity		
Panel means: Included				Panel means: Included			
Time trend: Not included				Time trend: Not included			
Drift term: Not included	ADF regressions: 0 lags			Drift term: Not included	ADF regressions: 1 lag		
		Statistic	p-value			Statistic	p-value
Inverse chi-squared(42)	P	482.0855	0.0000	Inverse chi-squared(42)	P	264.5215	0.0000
Inverse normal	Z	-19.6046	0.0000	Inverse normal	Z	-13.0469	0.0000
Inverse logit t(104)	L*	-29.8613	0.0000	Inverse logit t(109)	L*	-15.9676	0.0000
Modified inv. chi-squared	Pm	48.0173	0.0000	Modified inv. chi-squared	Pm	24.2791	0.0000
P statistic requires number of panels to be finite. Other statistics are suitable for finite or infinite number of panels.				P statistic requires number of panels to be finite. Other statistics are suitable for finite or infinite number of panels.			

**Table 9: Dynamic panel-data estimation (One-step & two-step GMM)**

Dynamic panel-data estimation, one-step system GMM

lnExport	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnExport						
L1.	.0034705	.0009532	3.64	0.000	.0016023	.0053387
lnER	-2.11685	.0378633	-55.91	0.000	-2.19106	-2.042639
lnGDP	6.922561	.1132384	61.13	0.000	6.700618	7.144504
lnLF	-15.65141	.2564241	-61.04	0.000	-16.15399	-15.14882
lnCPI	1.45851	.035204	41.43	0.000	1.389511	1.527508
lnFDI	.9841504	.0009406	1046.32	0.000	.9823069	.9859939
lnGDS	-.6338167	.0193744	-32.71	0.000	-.6717898	-.5958435
lnRoad	-1.147044	.056771	-20.20	0.000	-1.258313	-1.035775
lnITR	-.3904944	.0411844	-9.48	0.000	-.4712144	-.3097745
TON	.6494785	.0268624	24.18	0.000	.5968292	.7021279
CI	-.072591	.0012842	-56.53	0.000	-.0751081	-.070074
_cons	205.515	3.48601	58.95	0.000	198.6825	212.3474

Dynamic panel-data estimation, two-step system GMM

lnExport	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnExport						
L1.	.003829	.0016195	2.36	0.018	.0006549	.0070031
lnER	-1.583079	.317638	-4.98	0.000	-2.205638	-.9605203
lnGDP	5.361409	2.826687	1.90	0.058	-.1787948	10.90161
lnLF	-14.56939	9.138196	-1.59	0.111	-32.47993	3.341142
lnCPI	1.771622	.5326216	3.33	0.001	.7277023	2.815541
lnFDI	.9971405	.0010191	978.42	0.000	.9951431	.999138
lnGDS	-.2620943	.4167342	-0.63	0.529	-1.078878	.5546896
lnRoad	-.7544673	1.396641	-0.54	0.589	-3.491833	1.982899
lnITR	-.7363164	1.086827	-0.68	0.498	-2.866458	1.393825
TON	.7507321	.6834471	1.10	0.272	-.5887996	2.090264
CI	-.0715858	.0403607	-1.77	0.076	-.1506913	.0075197
_cons	195.9304	128.6342	1.52	0.128	-56.18801	448.0487