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**ADDIS ABABA UNIVERSITY  
SCHOOL OF GRADUATE STUDIES**

**The Impact of Preferential Trade Agreements on  
Ethiopian Export**

**BY**

**Abel Solomom**



**JUNE, 2012  
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*A PROJECT PAPER SUBMITTED TO THE SCHOOL OF GRADUATE  
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*(M.A. IN COMPETITION POLICY AND REGULATORY ECONOMICS)*



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## Acronyms

AGOA	Africa Growth Opportunity Act
COMESA	Common Market for Eastern and Southern Africa
COMSA FTA	Common Market for East and South Africa Free Trade Area
EBA	Everything But Arms
EPA	Economic Partnership Agreement
EU	European Union
FTA	Free Trade Area
GATT	Generalized Agreement on Trade and Tariff
GDP	Gross Domestic Product
GSP	Generalized System of Preference
IMF	International Monetary Fund
LDCs	Least Developed Countries
MFN	Most Favored Nation
MTL	Multilateral Trade Liberalization
NBE	National Bank of Ethiopia
PTA	Preferential Trade Agreement
RoR	Rule of Origin
RTA	Regional Trade Agreement
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference on Trade and Development
US	United States
WB	World Bank
WTO	World Trade Organization
WW	World War



## **Abstract**

The purpose of this paper is to discuss and analyze the impact of Preferential Trade Agreements (PTA) on Ethiopia's export performance. A gravity trade model is employed by using panel data for 31 main trading partners of Ethiopia covering the period 2000-2010. The estimation result suggests that the export of the country is highly dependent on non-reciprocal preferential market access provisions granted by developed countries which could result in preference erosion when trade is further liberalized. The paper also assesses other determinants of the export sector. GDP and population of Ethiopia are positively related to the country's export while the populations of importing nations and COMESA dummy have negative impact on the export.

# Chapter One

## 1. Introduction

### 1.1 Background of the Study

Participation in preferential trade agreements (PTAs) has grown rapidly in recent years. In 1990, there were only about 70 PTAs in force in the world. Thereafter, PTA activity accelerated noticeably; by 2010 the number of PTAs in force was close to 300. PTAs have transcended regional boundaries and levels of economic development. One half of the PTAs currently in force are not strictly "regional" with the advent of cross-regional PTAs being particularly pronounced in the last decade. Two thirds of all PTAs in force are between developing countries, about a quarter are between developed and developing countries and the remainder between developed countries only (voxeu.org, 2011).

There are different opinions regarding the impact of non-reciprocal PTAs on developing countries economy. Ozden and Reinhardt (2003) argue that these preferences are dishonest provisions by developed countries which would dampen trade liberalization efforts by developing countries. Such preferences lie outside the binding of WTO legal system so that they can be unilaterally modified or cancelled at any time by donor countries.

Currently all most all developing countries receive nonreciprocal preferential market access to the market of developed countries. But the benefit gained from these preferences is very limited. According to Wijayasiri (2007) the reason for low utilization of PTAs could be restrictive and high rule of origin (ROR), low product coverage, lack of awareness or knowledge amongst exporters and administration and issuance of certificates.



Like most developing countries Ethiopia has made non-reciprocal preferential trade agreements with a number of developed countries. Under the various Generalized System of Preferences schemes (GSP), Ethiopia is one of the beneficiaries of preferential trade access for a wide spectrum of commodities from a number of advanced countries, including, among others, Australia, Canada, the European Union (EU), Japan, Norway, and the United States (US).

While GSP trade access is quite beneficial, there is a need to compete with all the beneficiaries (over 200 developing countries) for such markets. In other words, the GSP system is not an exclusive offer; both developing and least developed countries, including all East Asian countries, are beneficiaries of the system. The two most important preferential market accesses that Ethiopia currently enjoys are the Everything But Arms (EBA) and African Growth Opportunity Act AGOA (Kibre, 2008).

In February 2001, the European Council adopted the "EBA Regulation" granting duty-free access to imports of all products from LDCs, except arms and ammunitions, without any quantitative restrictions (with the exception of bananas, sugar and rice for a limited period). EBA was later incorporated into the GSP. The Regulation foresees that the special arrangements for LDCs should be maintained for an unlimited period of time and not be subject to the periodic renewal of the Community's scheme of generalized preferences (European Commission, 2009). Being a least developed economy, Ethiopia is one of the 42 LDCs currently benefiting from the full quota and duty free privilege to the EU market. Given Ethiopia's relative proximity and the large size of the EU market, the EBA is, perhaps, the most important foreign market for its exports (Kibre, 2008).

AGOA, which was introduced by the American president in May 2000, is the other major quota and duty free privilege granted to exports from Sub-Saharan Africa (SSA) countries to the US market. This act is a US initiative which extends bilateral trade

preferences to eligible SSA countries and is an extension of the GSP program (Nouve, 2005).

AGOA confers very significant benefits on Ethiopia, affording it the most liberal access to the US market available to any country or region with which the US does not have a Free Trade Agreement. Ethiopia will be able to benefit from duty-free access for thousands of products under the GSP for seven years longer than the rest of the world and for many more tariff line items. In addition, Ethiopia is exempted from competitive need limitations which cap the GSP benefits available to beneficiaries in other countries. AGOA also provides enhanced US market access for apparel and Ethiopia, as a specially designated beneficiary nation, enjoys even greater access than do many other African nations.

## **1.2 Statement of the Problem**

Increase in the volume of trade is without a doubt a key element for economic growth and alleviation of poverty for world's poor countries to reap the potential benefits of globalization. David (1999); by using evidence obtained from countries engaged in bilateral trade in a given regional integration; show that incomes converges upward and poverty reduces with increased volume of trade after implementing more liberal bilateral economic agreements.

But how to increase the performance of developing countries in world trade is still debatable. Developed countries have unilaterally liberalized trade by giving non-reciprocal preferences for developing countries so that these countries could benefit from the preferential market access. But Ozden and Reinhardt (2005) state that unilateral trade liberalization undermine the relationship between export performance and trade policy in the recipient countries which affect their future of adapting appropriate policy instruments during the inevitable multilateral trade liberalization. And they suggest that developing countries should abandon reliance on non-reciprocal

special and differential trade agreements and move to the more reliable reciprocal market access agreements.

Ethiopia is currently in negotiation with different countries of the world to be a member of some reciprocal trade agreements, which could be considered as movement away from special and differential trade agreements. The negotiations include World Trade Organization (WTO), Economic Partnership Agreement (EPA) and Common Market for East and South Africa Free Trade Area (COMESA FTA). However, before moving to reciprocal trade agreements it is better to analyze the effect that non-reciprocal PTAs has on the export sector. This research, therefore, attempts to investigate the impact of non-reciprocal PTAs on total export of the country. It also tries to identify and analyze other determinants of the country's export performance.

### **1.3 Objectives of the Study**

The general objective of this paper is to examine the impact of Ethiopia's Preferential Trade Agreements on the country's total export earnings.

The specific objectives are:

- ❖ To review the preferential market access agreements of Ethiopia.
- ❖ To identify and analyze the determinants of export of the country
- ❖ To draw conclusions and policy recommendations from the implied results.

### **1.4 Methodology**

The study utilizes secondary data to address the problem of the research and accomplish the objective. The data used for this study are obtained from World Bank World Development Indicators, International Monetary Fund World Economic Outlook Database, Ethiopian Revenue and Custom Authority, National Bank of Ethiopia and CEPII online database.



Both descriptive and empirical analysis is employed to accomplish the task at hand. For descriptive analysis, both the data and empirical research outputs of various scholars were used. For the empirical analysis, the study employed gravity model of international trade. The detail is presented in chapter 3 of the paper.

## **1.5 Significance of the Study**

This paper is significant in that it analyzes impact of PTAs on the countries total export. Since Ethiopia is on the process of making new trade agreements the evaluation of previous agreements is quit important. Further, the study identifies and examines other factors that significantly affect Ethiopia's export performance. Lastly it provides recommendations on the basis of the conclusions which could help Ethiopia to better her export performance.

## **1.6 Organization of the Study**

This thesis will be organized in five chapters. General introduction will be given in the first chapter and the second chapter is going to be literature review. Chapter three will contain theoretical and empirical model specification and the type of data employed. Chapter four provides descriptive statistics and econometric results as well as discussions on results. Finally, the last chapter will contain the conclusions and recommendations.



# Chapter Two

## 2. Review of Literature

### 2.1 Theories of Preferential Trade Agreements

Rapidly expanding trade is one of the pillars of the global rise and spread of economic prosperity in the post-war period. Billions of people would still be in poverty today was it not for the world trading system. A key element in this trade expansion has been the steady reduction of tariffs and other trade barriers. Much of this liberalization was accomplished by global trade negotiations - like the ongoing 'Doha round' talks, and eight other GATT 'rounds' that have been completed since WW II. Non-discrimination is a key principle of these global tariff-cutting initiatives; any tariff cutting by, say the EU or US, is automatically extended in a non-discriminatory manner to all WTO member. (A. DeRosa and Hufbauer, 2007)

More recently, however, a great deal of tariff cutting has taken place within exclusive trade agreements, so called preferential trade agreements. These agreements are trade pacts between countries that reduces tariffs for certain products to the countries who sign the agreement. While the tariffs are not necessarily eliminated, they are lower than countries not party to the agreement. It is a form of economic integration. These agreements could be either bilateral trade agreements; when signed between two sides, where each side could be a country (or other customs territory), a trade bloc or an informal group of countries (or other customs territories); or multilateral trade agreements which are signed between more than two sides typically neighboring or in the same region (Businessdictionary.com).

The first PTA was signed by Belgium, the Netherlands and Luxemburg in 1944 which created a customs union, limiting duties and tariffs on trade among the countries. In 1952, the European Coal and Steel Community was established. The number of PTAs

has grown over the years, with the 1990s showing a dramatic increase. In 1947, the WTO listed 109 regional trade agreements, or PTAs based on geographical region. Between 1995 and 2000, another 111 agreements were listed (ehow.com).

Preferential liberalization intrinsically has ambiguous effects on trade flow; the 'liberalization' part of preferential liberalization tends to stimulate global trade, but the 'preferential' part tends to distort trade. When thinking about the impact of preferential trade agreements, it is clearly important to quantify the amount of trade created and diverted (A. DeRosa and Hufbauer, 2007).

Trade creation occurs when trade flows are redirected due to the formation of a free trade area or a customs union. The issue was firstly brought into discussion by Jacob Viner (1950). Trade creation; after the formation of economic partnership; causes the cost of the goods to decrease leading to an increase of efficiency of economic integration. Hence, trade creation's essence is in elimination of customs tariffs on inner border of unifying states (usually already trading with each other), causing further decrease of price of the goods.

On the other hand Trade diversion occurs trade is diverted from a more efficient exporter towards a less efficient one by the formation of a free trade agreement or a customs union. When a country applies the same tariff to all nations, it will always import from the most efficient producer, since the more efficient nation will provide the goods at a lower price. With the establishment of a bilateral or regional free trade agreement, that may not be the case (Wikipedia).

Trade creation and trade diversion affect the economy differently. In general, trade creation, which results in a net economic gain, is the motive for countries to engage in PTAs given the fact that the price of an imported commodity is less than the domestic price of the same commodity. On the other hand, trade diversion generates a net economic loss whereby domestic consumers pay higher prices for imports from a high

cost PTA member than they would have paid if the imports were sourced from a low cost non-PTA member (Kanda and C. Jordaan, 2010).

In addition to the trade effects of economic partnership, it is likely that the economic structure and performance of participating countries may evolve differently than if they had not integrated economically. Reducing trade barriers brings about a more competitive environment and possibly reduces the degree of monopoly power that was present prior to integration. In addition, access to larger union markets may allow economies of scale to be realized in certain export goods. These economies of scale may result internally to the exporting firm in a participating country as it becomes larger, or they may result from a lowering of costs of inputs due to economic changes external to the firm. In either case they are triggered by market expansion brought about by membership in the union. The realization of economies of scale may also involve specialization on particular types of a good, and thus, trade may increasingly become intra-industry trade rather than inter-industry trade.

It is also possible that integration will stimulate greater investment in the member country from both internal and foreign sources. Investment can result from structural changes, internal and external economies and geographic markets now open to producers. Furthermore, foreigners may wish to invest in productive capacity in a member country in order to avoid being choked out of the union by trade restrictions and a high common external tariff. Economic integration at the level of the common market may lead to dynamic benefits from increased factor mobility. If both capital and labor have the increased ability to move from areas of surplus to areas of scarcity, increased economic efficiency and correspondingly higher factor incomes in the integrated area will emerge (Kwentua, 2006).

## 2.2 Critics on PTA Provisions for Developing Countries

Even though PTAs are supposed to provide advantage to the beneficiary developing countries, a host of scholars question this argument. For example, Alexandraki and Lankes (2004) argue that further liberalization of trade regimes may erode benefits of developing countries which receive preferential market access conditions. They noted that these countries resist multilateral trade liberalization (MTL) in fear of market loss due to preference erosion.

“Preference erosion” refers to declines in the competitive advantage that some exporters enjoy in foreign markets as a result of preferential trade treatment—both unilateral and reciprocal. Preference erosion can occur when export partners eliminate preferences, expand the number of preference beneficiaries, or lower their most-favored-nation (MFN) tariff without lowering preferential tariffs proportionately (Alexandraki and Lankes, 2004). Any reduction in MFN tariffs lower the preference margins that eligible LDCs gain from granted preferences. The implication is that the global trend towards MTL threatens gains to preference recipient countries for which reason exporters from developing countries lobby against MTL giving rise to trade protectionism (Hoekman and Michalopoulos, 2006).

Limao (2008) argue that the impact of PTA on MTL is not limited to preference erosion. PTAs could divert scarce negotiation resources, alter the number of negotiation parties and their bargaining power, and affect a country’s optimal multilateral tariffs in all or a subset of goods. PTAs could also create tension between more preferred developing countries (countries receiving preferential treatment) and other countries with respect to the effects of MFN liberalization by preference granting countries (Hoekman and Michalopoulos, 2006).



In addition the benefit obtained from trade preferences by developing countries is highly constrained by complex set of rules-of-origin (RoO) in the agreements. The RoO are normally used to prevent countries from exploiting different import tariff levels among trade partners. This practice is called trade deflection and can be defined as a change of direction for imports going through the country with the lowest import tariff (Wingard, 2011).

Heokman and Ozden (2003) note that RoO gives rise to enforcement costs, but they may also be captured by import competing lobbies seeking to make them prohibitively costly. They found out that one-quarter of trade flows paid the applicable MFN duty rather than claim duty-free treatment and RoO were equivalent to an import tariff between 3 and 5 percent. They also argue that RoO could make it more difficult to achieve economies of scale, since input requirements may vary to destination markets of the final products.

## **2.3 Ethiopia's Preferential Trade Agreements**

### ***2.3.1 Generalized System of Preferences (GSP)***

The concept of granting developing countries non-reciprocal preferential tariff rates to the markets of industrialized countries was first introduced in 1964 by Raul Prebisch, the first Secretary-General of the United Nations Conference on Trade and Development (UNCTAD). Known as the Generalized System of Preferences (GSP), it was adopted in 1968 at UNCTAD. Under GSP, certain products originating in LDCs are to be given reduced or zero tariff rates that supersede the Most Favored Nation (MFN) rates followed under the World Trade Organization (WTO) (Nguyen, 2008).

In 1971, signatories to the GATT approved a ten-year waiver of MFN in order to authorize GSP. Eight years later, they adopted the Enabling Cause, which is a permanent waiver that allows countries to give preferential treatment to LDCs. Each

country that chooses to implement GSP establishes different rules that specify which countries will be beneficiaries and which products from each shall be eligible for reduced or zero tariffs. There are thirteen parties that currently offer GSP preferences: Australia, Belarus, Bulgaria, Canada, Estonia, the European Union, Japan, New Zealand, Norway, the Russian Federation, Switzerland, Turkey, and the United States of America.

The goal of GSP is to promote economic growth and in the developing world and yet there are many factors that limit the full potential of this scheme. The EU and the US both administer market-distorting agricultural support programs that constrain agricultural export expansion in LDCs. They both undermine the use of GSP through the implementation of tariff escalation policies and complex Rules of Origin. In addition to this, the US excludes certain products from GSP in which LDCs have a comparative advantage, while also issuing competitive need limitations that can suspend GSP benefits. Annual reviews also destabilize GSP by leaving investors hesitant to invest due to uncertainty surrounding the future status of trade benefits. These are the numerous obstacles that limit the effectiveness of GSP (Nguyen, 2008).

Ethiopia is one of the beneficiaries of the GSP preferential trade access for a wide spectrum of commodities from a number of advanced countries, including, among others, Australia, Canada, the European Union (EU), Japan, Norway, and the United States of America (USA). While such preferential trade access is quite beneficial, there is a need to compete with all the beneficiaries (over 200 developing countries) for such markets. In other words, the GSP system is not an exclusive offer; both developing and least developed countries, including all East African countries, are beneficiaries of the system (Kibre, 2008).

GSP preferential access to EU markets can be classified into 3 categories: general GSP, GSP + and the Everything But Arms Initiative (EBA). The general GSP is given to 179

countries or territories for approximately 7200 products that are classified as being either "sensitive" or "non-sensitive." Sensitive products are goods that are considered to be of special importance to the EU that require some protection for one reason or another. Non-sensitive products do not have this stipulation so larger concessions on these goods are more freely given. Non-sensitive products received duty free access to the EU market while sensitive items received reductions in tariffs.

GSP+ expands the duty-free benefits possible under GSP to sensitive products for countries whose economies are especially "vulnerable due to their lack of diversification and insufficient integration into the international trading system." And the Everything But Arms initiative provides extra special treatment for the 50 least developed countries (Nguyen, 2008).

### *2.3.2 Everything But Arms (EBA)*

Traditionally, European countries have been admitted that the group of least developed countries (LDCs) should receive more favorable treatment than other developing countries (europa.eu). LDCs are formally recognized by the United Nations based on three structural handicaps low-income, a lack of human resources, and economic vulnerability (Nguyen, 2008). Gradually, market access for products from these countries has been fully liberalized. In February 2001, the Council adopted EBA Regulation granting duty-free access to imports of all products from LDCs to Europe, except arms and ammunitions, without any quantitative restrictions, with the exception of bananas, sugar and rice for a limited period (europa.eu).

EBA was later incorporated into the GSP Council Regulation. The Regulation foresees that the special arrangements for LDCs should be maintained for an unlimited period of time and not be subject to the periodic renewal of the Community's scheme of generalized preferences (europa.eu). Effectiveness of EBA is limited by the same factors that limit the general GSP programs: the EU's cap, tariff escalation, the Rules of Origin,

and utilization rates. The utilization rate of EBA is far below that of general GSP, less than 3%. This can be accounted for by the fact that many of the exports to the EU are already duty-free or are entering under the Cotonou Agreement, which is not under the purview of GSP. Rules of Origin are more restrictive under EBA because it does not allow sourcing from outside EBA countries, whereas the Cotonou Agreement, with some exceptions, allows duty-free access to processed products that source outside of the beneficiary countries. So even though EBA may have the most favorable rates, the inconvenience of complying with its requirements makes other options more effective.

Being a least developed economy, Ethiopia is one of the LDCs currently benefiting from the full quota and duty free privilege to the EU market. Given Ethiopia's relative proximity and the large size of the EU market, the EBA is, perhaps, the most important foreign market for its exports (Kibre, 2008).

### *2.3.3 The African Growth Opportunity Act (AGOA)*

In May 2000, Congress approved a new U.S. trade and investment policy for sub-Saharan Africa in the African Growth and Opportunity Act (Langton, 2008). The purpose of this legislation was to assist the economies of Sub-Saharan Africa and to improve economic relations between the United States and the region. The legislation authorized the President of the United States to determine which sub-Saharan African countries would be eligible for AGOA on an annual basis. The eligibility criterion was to improve labor rights and movement toward a market-based economy. Each year, the President evaluates the Sub-Saharan African countries and determines which countries should remain eligible.

Additional rules of origin are applied to apparel. Having AGOA eligibility does not imply automatic eligibility for a "Wearing Apparel" provision. To export apparel and certain textile to the United States under the AGOA duty-free, an eligible country must



have implemented a "Visa System" that satisfies American authorities and proves compliance with the AGOA rules about origin (Wikipedia.com).

AGOA provides trade preferences for quota and duty-free entry into the United States for certain goods, expanding the benefits under the Generalized System of Preferences (GSP) program. Notably, AGOA expanded market access for textile and apparel goods into the United States for eligible countries, though many other goods are also included. This resulted in the growth of an apparel industry in southern Africa, and created hundreds of thousands of jobs. However, the dismantling of the Multi Fibre Agreement's world quota regime for textile and apparel trade in January 2005 reversed some of the gains made in the African textile industry due to increased competition from developing nations outside of Africa, particularly China. Some factories shut down in Lesotho, where most of the growth occurred. Orders from African manufacturers stabilized somewhat after the imposition of certain safeguard measure by U.S. authorities, but Africa's share of the U.S. market was still reduced after the phase out.

Initially, AGOA was set to expire in 2008, but the United States Congress passed the AGOA Acceleration Act of 2004, which extended the legislation to 2015. The Act's apparel special provision, which permits lesser-developed countries to use foreign fabric for their garment exports, was to expire in September 2007.

Statistics suggest a positive balance of trade for AGOA participant countries. In 2008, the United States exported \$17,125,389 in goods to the 41 AGOA countries, and the U.S. imported \$81,426,951 for a balance of \$64,301,562 in favor of the AGOA countries.

The African Growth and Opportunity Act (AGOA) confers very significant benefits on Ethiopia, affording it the most liberal access to the US market available to any country or region with which the US does not have a Free Trade Agreement. Ethiopia will be able to benefit from duty-free access for thousands of products under the Generalized

System of Preferences (GSP) for a guaranteed period of eight years, seven years longer than the rest of the world and for many more tariff line items. In addition, Ethiopia is exempted from competitive need limitations which cap the GSP benefits available to beneficiaries in other countries.

AGOA also provides enhanced US market access for apparel and Ethiopia, as a specially designated beneficiary nation, enjoys even greater access than do many other African nations. Until the end of September, 2004, apparel made from textiles originating anywhere in the world may enter the US duty-free and effectively quota-free. (Non-specially designated African nations must use US origin fabric, yarn and thread to qualify). This apparel benefit will begin once Ethiopia's Textile export control system is certified by the US government, a process now underway. These specially enhanced AGOA benefits, coupled with Ethiopia's pro-business policies and environment, make the country a strong investment prospect for a wide range of American firms.

# Chapter Three

## 3. Methodology

### 3.1 The Gravity Model of Trade

The gravity trade model is an empirical model that explains bilateral trade between two countries or regions in terms of their populations and incomes, and barriers between the two, such as distance apart or tariffs (Barrett, Sen and Voicuc, 2011). It estimates the pattern of international trade flow. Although later the model was tested for flows of foreign direct investment and labor migration, trade flows remained the most frequently explored object with the gravity model (Anderson, 2011).

Gravity has long been one of the most successful empirical models in economics, ordering remarkably well the enormous observed variation in economic interaction across space in both trade and factor movements. The good fit and relatively tight clustering of coefficient estimates in the vast empirical literature suggested that some underlying economic law must be at work (Anderson, 2011). Gravity's main comparative advantage lies in its ability to use real data to assess the sensitivity of trade flows with respect to policy factors we are interested in (Shepherd, 2009).

The antecedents for using the gravity approach to model international trade flow date back to Tinbergen (1962), Poyhonen (1963) and Linnemann (1966) (Paas, 2000). Tinbergen (1962) and Poyhonen (1963) did the first econometric studies of trade flows based on the gravity equation, for which they gave only intuitive justification. Linnemann (1966) added more variables and went further toward a theoretical justification in terms of a Walrasian general equilibrium system, but the Walrasian model tends to include too many explanatory variables for each trade flow to be easily reduced to the gravity equation.



Since then the gravity model has been used and increasingly improved in empirical studies of international trade flow. Anderson (1979) derived gravity equation using assumption about world with product differentiation. He did not discriminate between international trade theories in his specification. Helpman and Krugman (1985) showed that the basic gravity equation could be derived from the differentiated products trade theory. Deardorff (1995) established that the gravity model is also consistent with the Heckscher-Ohlin international trade theory; the idea of gravity became very popular in explaining volumes and patterns of trade.

Even though the debate on the theoretical grounds of the model continues, it is more or less clear that whether because of the monopolistic competition nature of industries or because of comparative advantage and countries' specialization trade flows obey the law of gravity (Adugna, 2006)

The gravity model originates from the Newtonian physics notation. Newton's gravity law in mechanics states that two bodies attract each other proportionally to the product of each bodies mass divided by the square of the distance between their respective centers of gravity (Rahman, 2006). In equation form it is expressed as

$$GF_{ij} = \frac{M_i M_j}{D_{ij}^2} \text{-----} 1$$

In this equation, the gravitational force  $GF_{ij}$  is directly proportional to the masses of the objects ( $M_i$  and  $M_j$ ) and indirectly proportional to the distance between them ( $D_{ij}$ ).

The gravity model is analogous to this law. The analogy is as follows: "the trade flow between two countries is proportional to the product of quantities (economic masses) to be estimated, divided by the distance between the countries respective economic centers of gravity, generally their capital city, raised to the power of another quantity, to be determined (Rahman, 2006).

$$X_{ij} = \frac{\alpha M_i^{\beta_1} M_j^{\beta_2}}{D_{ij}^{\beta_3}} \text{-----} 2$$

In the above equation  $X_{ij}$  represents country  $i$ 's total export to country  $j$ ,  $M_i$  and  $M_j$  are relative economic mass of country  $i$  and  $j$  and  $D_{ij}$  is the geographical distance between country  $i$ 's capital city and country  $j$ 's capital city.

Gravity models are estimated in terms of natural logarithms, denoted "ln". In this form, what is multiplied in equation 2 becomes added, and what is divided becomes subtracted, translating equation 2 into a linear equation:

$$\ln X_{ij} = \alpha + \beta_1 \ln M_i + \beta_2 \ln M_j - \beta_3 \ln D_{ij} \text{-----} 3$$

Traditionally gravity model uses distance between countries to model transportation cost. Distance is almost always measured using the "great circle" formula. This formula approximates the shape of the earth as a sphere and calculates the minimum distance along the surface. Leamer and Levinsohn's (1994) survey of the empirical evidence on international trade offers the identification of distance effects on bilateral trade as one of the "clearest and most robust empirical findings in economics" (Head, 2000).

There are a few alternative ways to handling the economic mass of countries in equation 3. One alternative, with the most solid theoretical foundations, is measuring the economic mass through the gross domestic product (GDP) of the countries. In this case, equation 3 becomes:

$$\ln X_{ij} = \alpha + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j - \beta_3 \ln D_{ij} \text{-----} 4$$

In general, the expected signs here are  $\beta_1; \beta_2 > 0$ . However, the economics of equation 5 can lead to the interpretation of GDP as income, and when applied to agricultural goods, Engels's Law allows for GDP in the destination country to have a negative influence on demand for imports. Hence it is also possible that  $\beta_2 < 0$ .

In the other alternative, economic mass in equation 3 is associated with both GDP and population (POP). In this case, equation 4 becomes:

$$\ln X_{ij} = \alpha + \beta_1 \ln GDP_i + \beta_2 \ln GDP_j + \beta_3 \ln POP_i + \beta_4 \ln POP_j - \beta_5 \ln D_{ij} \text{---- } 5$$

With regard to the expected signs on the population variables, these are typically interpreted in terms of market size and are therefore positive  $\beta_3; \beta_4 > 0$ . That said, however, there is the possibility of import substitution effects as well as market size effects. If the import substitution effects dominate, the expected sign is  $\beta_4 < 0$ . Other alternatives of measuring economic mass are through GDP per capita and with both gross domestic product and GDP per capita. (Anderson, 2011)

### 3.2 Empirical Model of the Study

This paper uses standard gravity model derived by Anderson (1979) to assess the impact of PTA on the export of Ethiopia. The model basically postulates that the trade flow is proportional to a product of degrees of the nations' economic masses (measured by GDP and population) and inversely proportional to the trade distance between the nations.

$$\ln X_{ijt} = \alpha_0 + \alpha_1 \ln GDP_{it} + \alpha_2 \ln GDP_{jt} + \alpha_3 \ln POP_{it} + \alpha_4 \ln POP_{jt} + \alpha_5 \ln D_{ij} + U_{ijt} \text{----- } 6$$

It is common to include additional geographical and institutional variables that are assumed to facilitate or impede bilateral trade in the gravity equation. In this paper some geographical and institutional variables are added to the basic gravity model. The dummy variable COMESA is added to capture the effect of being a member of COMESA on Ethiopia's export. The average nominal exchange rate between Ethiopia currency (birr) and her trading partner is also included to control the effect of exchange rate fluctuation.

Finally a dummy variable PTA is included in the model. PTA represents all non-reciprocal preferential market access that the country receives from advanced countries; which includes the likes of GSP, EBA and AGOA. The inclusion of this variable as explanatory variable is on the basis of the possibility that having a PTA with trading partners would have an overall effect on total export of Ethiopia.

By including these variables the gravity model became a dynamic gravity model given by:

$$\ln X_{ijt} = \alpha_0 + \alpha_1 \ln GDP_{it} + \alpha_2 \ln GDP_{jt} + \alpha_3 \ln POP_{it} + \alpha_4 \ln POP_{jt} + \alpha_5 \ln D_{ij} + \alpha_6 PTA_{ijt} + \alpha_7 COMESA_{ijt} + \alpha_8 \ln ER_{it} + U_{ijt} \text{-----} 7$$

Where;

$X_{ijt}$  represents exports of Ethiopia to its trade partner j at time t,

$GDP_{it}$  represents gross value of the GDP of Ethiopia at time t,

$GDP_{jt}$  represents gross value of the GDP of country j at time t,

$POP_{it}$  represents total population of Ethiopia at time t,

$POP_{jt}$  represents total population of country j at time t,

$D_{ij}$  represents distance between capital city of Ethiopia (Addis Ababa) and capital city of country j,

$PTA_{ijt}$  represent a dummy variable which takes value 1 if country j gives preferential treatment for Ethiopia at time t and 0 otherwise,

$COMESA_{ijt}$  represents a dummy variable which takes value 1 if country j is a member of COMESA at time t and 0 otherwise,

$ER_{it}$  represent nominal exchange rate of birr at time  $t$  and

$U_{ijt}$  represents stochastic term a log-normally distributed error.

The relationship between Ethiopia's exports and both GDP measures is expected to be positive. A higher GDP in Ethiopia means a higher production capacity which in turn translates into the ability of the Ethiopia economy to export more. On the other hand, a higher GDP for a trading partner country means a higher absorption capacity or the ability to import more. Therefore; the expected sign of  $\alpha_1$  and  $\alpha_2$  is positive.

There is no clear a priori relationship between exports and the populations of both the exporting and importing countries. The estimated coefficient of the exporter's population could either be positive or negative depending on whether the exporter has a large population and exports more (economies of scale) or the fact that the exporter has a large population but exports less (absorption effect). In the same vein, the estimated coefficient of the trading partner country's population could either be positive or negative (Kanda, 2010).

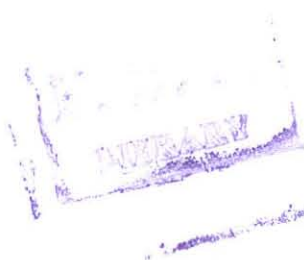
The expected value of  $\alpha_5$  is negative since distance is normally expected to be negatively related to trade flow in gravity model of bilateral trade. This is because the higher the distance between trading partners, the higher the costs involved in trading and therefore a negative effect on trade flow.

The estimated coefficient of PTA and COMESA are expected to be positive because both are trade agreements that intend to facilitate trade between countries. Finally exports and real exchange rate are expected to be positively related as higher rates of exchange (depreciation of birr) enhances the competitiveness of the domestic goods, resulting in higher demand for Ethiopia's exports.

### 3.3 Data Type and Source

This paper uses panel data to examine the impact of PTA on Ethiopia's export. For this purpose 31 trading partner of Ethiopia and a time span of 11 years are selected. The countries are chosen based on their importance for Ethiopia as a trading partner and the data availability for the different variables. The time span covers from 2000 to 2011. The reason for selecting 2000 G.C as a starting period is because this year was the year that Ethiopia started benefiting from both EBA and AGOA.

The data used in this paper are secondary data extracted from different sources. The annual values (in USD million) of Ethiopian total exports to each of the 31 trading partners are mainly collected from Ethiopia Revenue and Custom Authority. The gross domestic product data are available from World Bank national accounts data, World Development Indicators. The data on population of each country is taken from International monetary fund, world economic outlook database. The exchange rate data is obtained from NBE. Finally data on distances between Ethiopia and her trading partners are collected using the CEPII online database [www.cepii.fr](http://www.cepii.fr).



## Chapter Four

### 4. Analysis of the Study

#### 4.1 Data Exploration

Before going into the estimation of an econometric model it is crucial to explore the statistical characteristics of the data set. Stata data exploration is considered to be prerequisite for good model formulation and econometric estimation. It is important to know the pattern of the data in order to model it in a mathematical form (Alemayehu, 2011).

The summary statistics of the variables to be estimated in our model are presented in Annex 2. Most of the variables, except the Population of Ethiopia, happen to have positively skewed and leptokurtic distribution which lacks kurtosis. For instance, total export has skewness and kurtosis of 2.52 and 11.41, respectively. In a similar manner the summary statistics of all other variables as well as the log transformed variables (which are used in the econometric model) can be gauged from Annex 2.

Following this we come to the graphical inspection of the transformed variables under consideration. The graphical tool we analyze is the box plot of the variables which gives us a rough indication of whether the variables under consideration are normally distributed or not. Looking at the box plots for the variables one can guess that the log transformed variables used in our model are more or less normally distributed (See Annex 3).

## 4.2 Diagnostic Tests

Before proceeding to our estimation, we need to diagnose our estimation procedures so that it would be possible to identify which estimation technique fits our model and data well. The following are summaries of the diagnostic tests and of which the test results have been attached in the annex.

### 4.2.1 Presence of Fixed Effects

An F-test was conducted in order to determine the presence of fixed effects. If the time and country specific effects are not important, one can estimate a restrictive model using pooled OLS instead of the unrestricted fixed effect model. The null hypothesis is that a restrictive model (OLS) is appropriate, that all of the units share the same intercept. The test statistic according to (Baktagi, 2009) is;

$$F_{obs} = \frac{(RRSS-URSS)/(N-1)}{URSS/(NT-N-K)} H_0 \sim F_{N-1, N(T-1)-K}$$

The null and alternative hypotheses are:

$H_0$ : There are no time specific effects.

Against

$H_1$ : Not  $H_0$

Using this test statistics, the calculated value does not allow us to reject the null hypothesis since the calculated p-value 0.0498 is greater than 0.01 we fail to reject the null hypothesis that says the year coefficients are jointly zero. Therefore we can conclude that there is no time specific effects (see Annex 4)

#### 4.2.2 Hausman Specification Test

The Hausman specification test is the classical test of whether the fixed or random effects model should be used. The fundamental distinction between fixed and random effect model is the assumption whether the unobserved individual heterogeneity are correlated with the rest of the regressors or not. If the specific effects are correlated with the regressors, fixed effect estimates are consistent but the random effect estimates are not consistent. If the regressors are uncorrelated with the  $u_i$ , both fixed and random effect estimators are consistent, withal the random effect estimators are efficient (Wooldridge, 2004).

The Hausman test is a way of comparing two estimators; one which is consistent under both the null and alternative hypothesis and one which is consistent (and typically efficient) under the null hypothesis only. A significant difference between the two estimators indicates that the null hypothesis is unlikely to hold. The test statistics goes as (Verbeek, 2004):

$$Chi^2(k) = (\hat{\beta}_{FE} - \hat{\beta}_{RE})' [\hat{V}\{\hat{\beta}_{FE}\} - \hat{V}\{\hat{\beta}_{RE}\}]^{-1} (\hat{\beta}_{FE} - \hat{\beta}_{RE})$$

Where;  $FE$  is for fixed effects and  $RE$  is for random effects.

Under this test the hypotheses are:

$H_0$ : Difference in coefficients is not systematic

Against

$H_1$ : There is a systematic difference in coefficients

Using this statistics, since the calculated p-value 0.7766 is greater than 0.01 we fail to reject the null hypothesis that claims the difference in coefficients is not systematic. From this we can conclude that we can stick to the random effects model (see Annex 4)

#### *4.2.3 Breusch and Pagan Lagrangian Multiplier Test*

A simple test for heteroskedastic disturbances in a linear regression model is developed using the framework of the LM test (Breusch & Pagan, 1979).

The null and alternative hypotheses in this test are,

$H_0$ : Homoskedasticity

Against

$H_1$ : Not  $H_0$

Based on this test, the p-value is less than 0.01; so we reject the null hypothesis of homogeneous variance of residuals. This test shows the existence of heteroskedasticity (table Annex 4). This further stresses that we cannot use OLS to estimate our model because of the presence of specific effects.

#### *4.2.4 Test for Serial Autocorrelation*

$H_0$ : No first order autocorrelation

Against

$H_1$ : Not  $H_0$

Based on this test, the p-value is less than 0.01; so we reject the null hypothesis (see annex 4). This indicates the prevalence of serial autocorrelation.

### **4.3 Estimation Techniques**

From the section under diagnostic tests we can understand the presence of heteroskedasticity and autocorrelation in our data. One of the basic assumptions for the ordinary least squares regression is the homogeneity of variance of the residuals. Though heteroskedasticity does not cause inconsistency in estimators, it leads to bias in the formula for the variance which in turn invalidates the standard errors, introducing inefficiency in OLS estimators. When the usual assumption of homoskedastic is not met, the test statistics used to test hypotheses under the Gauss-Markov assumptions are no longer valid (Wooldridge, 1999).

And when one or more explanatory variables are not exogenous and are correlated to the error term, it is said to possess serial autocorrelation. Ignoring this autocorrelation will result in consistent but inefficient estimates of the regression coefficients and biased standard errors (Baktagi, 2009).

For this reason the cross-sectional time-series feasible generalized least square (FGLS) will be used to estimate our model. FGLS estimators are appropriate when the assumptions of homoskedasticity and non correlation of regression errors fail. Under such circumstance this estimation is more efficient than OLS estimation, leading to smaller standard errors, narrower confidence interval and larger  $t$  statistics.

### **4.4 Estimation Results and Interpretation**

As explained in the previous section FGLS estimator will be used to estimate the gravity model specified in equation 7. The dependent variable is  $\ln$  of Ethiopian export value to 31 countries of the world. The lists of these countries have been attached to the annex. The data set that is used in this study covers the years from 2000 to 2010. The table below shows the estimation results obtained from the regression. All estimations and tests were done using Stata Version 11.

• **Table 4.1: Regression results**

**Dependent Variable: Ethiopia's Export to its Trading Partners**

<i>Independent variables</i>	<i>Coefficient</i>	<i>z-ratio</i>	<i>P&gt;z</i>
Ln of GDP of Ethiopia	0.540207 ***	3.75	0.000
Ln of GDP of importing nation	0.036188	0.84	0.399
Ln of population of Ethiopia	2.304628 *	2.29	0.022
Ln of populatoin of importing nation	-0.291763***	-6.96	0.000
Ln of distance	-0.522905***	-11.45	0.000
Ln of exchange rate	0.036010	0.17	0.869
Dummy for PTA	1.007763***	9.00	0.000
Dummy for COMESA	-0.392180**	-2.88	0.004
Constant	-30.1077	-1.97	0.049

*Number of observations = 340*

*Number of groups = 31*

*Wald chi<sup>2</sup>(8) = 1108*

*Prob > chi<sup>2</sup> = 0.000*

*Notes: The t-values are reported in parentheses. \*\*\*, \*\* and \* indicate significance at 1%, 5% and 10% levels respectively.*

From the estimation result we can see that the variables in the model are jointly significant. It is tested using the Wald test statistics which is computed to be 1108 with a p-value of zero at 1% significance level.

The regression results show that all the variables except Ln of GDP of importing nation and Ln of exchange rate are found to be statistically significant. Ln of GDP of Ethiopia, Ln of population of importing nation, Ln of distance and dummy for existence of PTA between Ethiopia and importing nation are all significance at 1% significance level. Dummy for COMESA member nation is significant at 5% while Ln of population of Ethiopia show significance at 10% significance level.

Regarding the signs of the estimates, most of the variables are in general with expected signs except dummy for COMESA. This means that the dummy for COMESA members has the opposite negative effect on Ethiopian exports. The possible explanation for this could be the similarity of economies between Ethiopia and other COMESA member nations. When there are more similarities between trading nation economies we can expect the trade among them to be more intensive, especially when they are developing countries.

As you can see from the above table the existence of non-reciprocal PTA between Ethiopia and its trading partner has been a significant variable in the export of the country during the past decade or so. Dummy for PTA represents the preferential market access agreements that Ethiopia receive from developed nations. This includes EBA to EU market, AGOA to US and GSP to a number of advanced countries.

If the importing nation granted a preferential market access to Ethiopia, the export of the country will increase by 1%, *ceteris paribus*. So we can say that dummy for PTA among the few variables that highly affected the export of Ethiopia.

As discussed in chapter 2 of the paper, the dependency on non-reciprocal preferential market access condition could negatively affect countries economy when further liberalization of trade is implemented since there is a high possibility of preference erosion, which is a decline in the competitive advantage that some exporters enjoy in foreign markets as a result of preferential trade treatments. The fear of preference erosion could be one of the reasons that Ethiopia is not still a member of WTO and EPA.

Looking at other explanatory variables, the GDP of Ethiopia has positive effect on the export, which is expected since higher GDP in the country means a higher production capacity which in turn translates into the ability of the economy to export more. We can observe that a 1% increase in the ln of GDP of Ethiopia will increase the exported value by 0.54%, *ceteris paribus*. GDP of importing country has an insignificant effect on



Ethiopian export which can tell us that Ethiopia cannot turn to GDP increase in the outside world as source of demand for its exports. This is because of the nature of commodities exported by the country which are almost entirely primary products. Primary commodities are mostly income inelastic, with increasing income in other countries of the world would not result in change in the demand of these products.

Regarding the population variables, the regression indicates increase in the population of Ethiopia will result in a positive effect on export of the nation. But the population of importing country will have negative impact. This can tell us that Ethiopia's trade partners imports less when it has bigger population or countries with small population import more than countries which have high population.

The negative coefficient of distance variable indicates that the distance between Ethiopia and its trading partners affects Ethiopian exports negatively. This is because the higher the distance between trading partners, the higher the costs involved in trading and therefore a negative effect on trade flow. As you can see from the table a 1% increase in distance will reduce Ethiopian exports by 0.52%, *ceteris paribus*

# Chapter Five

## 5. Conclusion and Recommendation

### 5.1 Conclusion

This study tried to empirically test the impact of preferential market access agreements of Ethiopia on aggregate export of the country to the world. An econometric gravity model of bilateral trade flows between Ethiopia and its trading partners has been specified and tested using annual data for Ethiopia and 31 of its main trading partners for period 2000-2010.

The empirical results suggest PTAs has positive and highly significant effect on Ethiopian export. As discussed in the literature review, the dependency in non-reciprocal preferential market access condition could affect countries effort in participation at multilateral trade liberalization (MTL) in fear of market loss due to preference erosion, which is a decline in the competitive advantage that some exporters enjoy in foreign markets as a result of preferential trade treatments. The fear of preference erosion could be one of the reasons that Ethiopia is resisting MTL (WTO and EPA).

This paper also tried to assess other factors which could affect the export sector of the nation. The export of Ethiopia is positively and significantly influenced by the GDP of the country. The GDP of importing nations do not have significant effect on the export. What we can understand from this is that since the majority of Ethiopian export commodities are primary products; which are income inelastic, we cannot expect an increase in the income of other countries would result in an increase in demand of these products.

Domestic population has positive influence on Ethiopian export while importing countries population has negative impact. Average nominal exchange rate has been found to be statistically insignificant. As the gravity model postulate distance has a negative effect on Ethiopia's export. The unexpected finding of the paper was the negative effect that COMESA membership has on the country's export. The possible explanation for this could be the similarity of economies between Ethiopia and other COMESA member nations. When there are more similarities between trading nation economies we can expect the trade among them to be more intensive. This is an interesting finding in a way that it reflects the pattern of trade between developing Africa nations.

## **5.2 Recommendation**

The study reveals the importance of non-reciprocal PTAs to Ethiopian exports in the last 11 years. Such preferences lie outside the binding of WTO legal system so that they can be unilaterally modified or cancelled at any time by donor countries. Ozden and Reinhardt (2003) state that unilateral trade liberalization undermine the relationship between export performance and trade policy in the recipient countries which affect their future of adapting appropriate policy instruments during the inevitable MTL. And they suggest that developing countries should abandon reliance on non-reciprocal special and differential trade agreements and move to the more reliable reciprocal market access agreements. As they suggested, Ethiopia should start to engage and rely on reciprocal trade agreements through formal institutional frameworks such as WTO and EPA.

It is normally believed that a depreciation of a country's exchange rate will result in a gain in competitiveness of that country in world trade. However, the results of this study indicate that a depreciation of exchange rate did not affect the demand and international competitiveness of Ethiopian exports. Therefore we should start taking different measures to enhance the competitiveness of exported products.

Since the world demand for primary products is not very dynamic, Ethiopia will not be competitive through exporting primary products which are the existing products with comparative advantage. Diversification of exports from primary to industrialized products and services shall be the main concern. Trade in services would be a very good potential for export diversification especially true for the landlocked nations whose opportunities to diversify among manufactured goods are limited due to the high cost of transportation of goods (PREM, 2010).



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## Annex 1: List of Ethiopia's Trade Partners Included in the Analysis

1	Australia	17	Malaysia
2	Belgium	18	Netherlands
3	Canada	19	Pakistan
4	China	20	Portugal
5	Djibouti	21	Saudi Arabia
6	Egypt	22	Singapore
7	France	23	South Africa
8	Germany	24	Spain
9	Great Britain	25	Sudan
10	Greece	26	Sweden
11	India	27	Switzerland
12	Israel	28	Turkey
13	Italy	29	United Arab Emirates
14	Japan	30	United States
15	Jordan	31	Yemen
16	Kenya		

## Annex 2: Summary Statistics

- Summary Statistics of the Level Variables

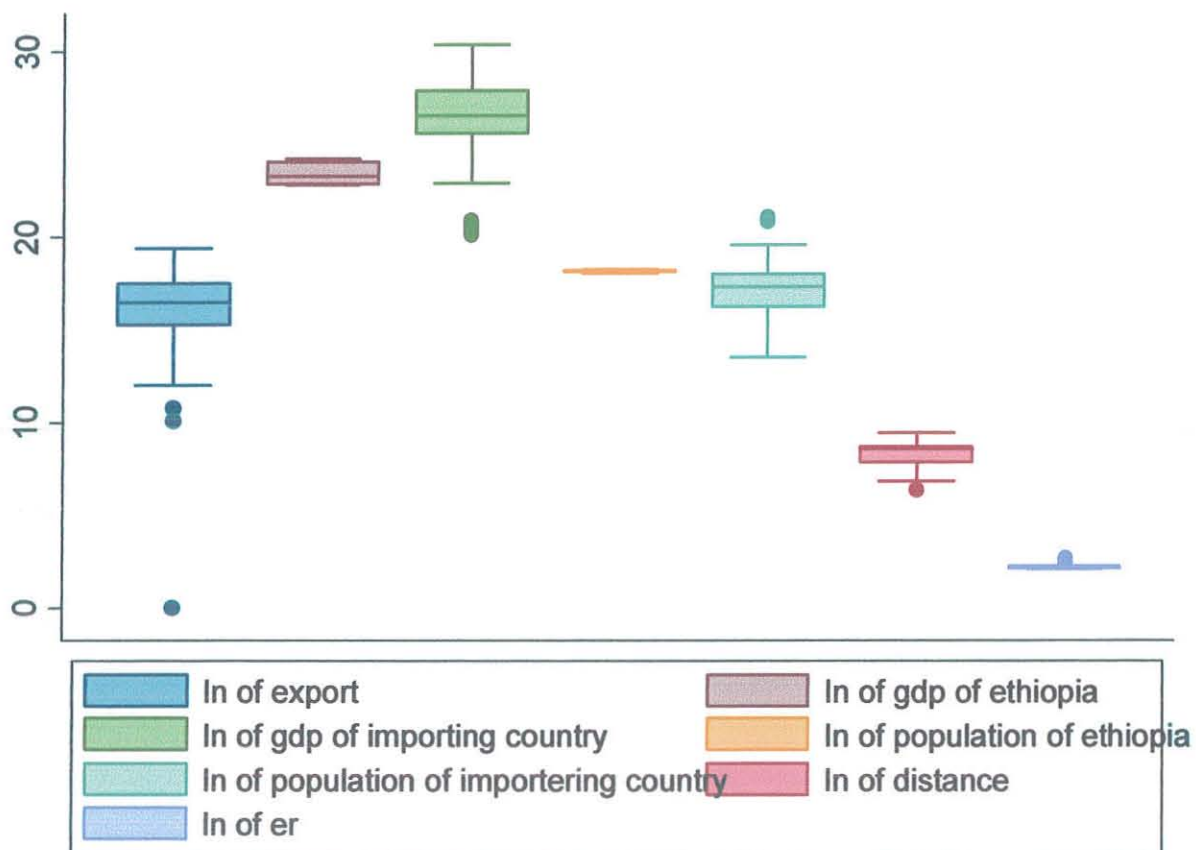
<i>Variables</i>	Mean	Sd	Skewness	Kurtosis	Cv
<i>Total Export Value</i>	28300000	37200000	2.52	11.41	1.32
<i>GDP of Ethiopia</i>	16200000000	8870000000	0.68	1.85	0.55
<i>GDP of Importing Country</i>	1180000000000	2360000000000	3.86	19.25	2.00
<i>Population of Ethiopia</i>	74000000	6793903	-3.74	42.30	0.09
<i>Population of Importing Country</i>	123000000	296000000	3.37	12.90	2.41
<i>Distance</i>	5107.93	3092.89	0.72	2.97	0.61
<i>Average Exchange Rate</i>	9.51	1.82	1.87	5.12	0.19
<i>Dummy for PTA</i>	0.58	0.49	0.34	1.11	0.85
<i>Dummy for COMESA</i>	0.13	0.34	2.21	5.90	2.60

- Summary Statistics of the Log Transformed Variables

<i>Variables</i>	<i>Mean</i>	<i>Sd</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>Cv</i>
<i>Total Export Value</i>	16.25327	1.73604	-2.72017	24.57922	0.106812
<i>GDP of Ethiopia</i>	23.36421	0.529187	0.372699	1.540869	0.02265
<i>GDP of Importing Country</i>	26.40011	1.977288	-0.7665	4.065721	0.074897
<i>Population of Ethiopia</i>	18.12025	0.074313	-0.08687	1.790724	0.004101
<i>Population of Importing Country</i>	17.2464	1.556468	0.344407	3.52363	0.090249
<i>Distance</i>	8.309531	0.752905	-0.84728	3.232281	0.090607
<i>Average Exchange Rate</i>	2.237393	0.166072	1.713914	4.547144	0.074226
<i>Dummy for PTA</i>	0.583578	0.49369	-0.33908	1.114976	0.845971
<i>Dummy for COMESA</i>	0.129032	0.335728	2.213176	5.898148	2.601894



### Annex 3: Box Plot for Log Transformed Variables



## Annex 4: Diagnostic Tests

- **Test for Presence of Fixed Effect**

Test: Ho: No time specific effects

$$F(9, 296) = 1.91$$
$$\text{Prob} > F = 0.0498$$

- **hausman Specification Test**

Test: Ho: difference in coefficients not systematic

$$\chi^2(6) = (b-B)'[(V_b - V_B)^{-1}](b-B)$$
$$= 3.25$$
$$\text{Prob} > \chi^2 = 0.7766$$

- **Heteroskedasticity Test using Breusch and Pagan LM Test**

Modified Wald test for group wise heteroskedasticity in fixed effect regression model

Test: Ho:  $\sigma(i)^2 = \sigma^2$  for all I (Homoskedasticity)

$$\chi^2(31) = 15100.02$$
$$\text{Prob} > \chi^2 = 0.0000$$

- **Serial Autocorrelation Test**

Wooldridge test for autocorrelation in panel data

Ho: no first-order autocorrelation

$$F(1, 30) = 26.760$$
$$\text{Prob} > F = 0.0000$$

## Declaration

This thesis is my original work and has not been presented for a degree in any other university, and that all sources of material used for the thesis have been duly acknowledged.

The examiners' comments have been duly incorporated.

Declared by

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