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**Addis Ababa University**  
**School of Graduate Studies**  
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**The Determinants of Export Performance in East  
African Countries: A Panel Data Approach**

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**Addis Ababa University**  
**School of Graduate Studies**  
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**The Determinants of Export Performance in East African Countries: A Panel Data Approach**

**A Master's Thesis Submitted to the School of Graduate Studies Addis Ababa University In Partial Fulfillment of the Requirements for the Degree of Masters of Science in Economics (International Economics)**

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### ***Abstract***

*The paper examines the effect of demand and supply side factors on East Africa countries total, agricultural raw materials, service and manufacture export performance. Thus, both internal and external aspects are responsible for poor export performance in the region. The study employed a panel data to empirically analysis these determinants in East Africa for the periods 2005 to 2014. A Sample of 7 countries from the region was selected for analyze the determinants of the exports of total, agricultural raw materials, service and manufacture based on the standard international trade classification. Based on the Hausman estimate the total and agricultural export fixed effect model is appropriate whereas for service and manufacture export random effect model is fitted. Using the first model (fixed effect) we found that the policy related to FDI and trade openness have impact on the total export performance in the region. And for model two (fixed effect) the agricultural raw materials export performance in this region is not influenced as the expected theoretical. Using random effect in the model of service sector human capital and foreign direct investment net inflow are the major factors to improve the service and manufacture sector export performance in the region. Moreover, except the agriculture raw material export the supply and demand sides' factors are found the major determinants of the total, service and manufacture export performance in the region.*

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## **LIST OF ACRONYMS**

AOA - Agreement on Agriculture

CC- Control of Corruption

CLRM – Classical Liner Regression Model

EA – Eat Africa

FAO – Food and Agriculture Organization

FDI – Foreign Direct Investment

G7- Group Seven Countries

GDP – Growth Domestic Product

GE - government effectiveness

IID - Independent and Identically Distributed

IMF – International Monetary Funds

IPS - Im, Pesara and Shin

LLC- Levin, Lin and Chu

LM - Lagrange Multiplier

NTT- New Trade Theory

OLS – Ordinary Least Square

PS - political stability and absence of violence

REER - Real Exchange Rate

RL - Rule of Law

RQ - Regulatory Quality

SADC - Southern African Development Community

SAP- Systems, Applications and Products

SITC – Standard International Trade Classification

SSA- Sub Saharan African

UN – United Nation

UNCTAD - United Nation Conference on Trade and Development

VA- Voice and Accountability

WB- World Bank

WGI- World Governance Indicators

WTO – World Trade Organization

## **CHAPTER ONE**

### **Introduction**

#### **1.1. Background of the study**

Today every society in the world strives to reach economic development. Achieving this economic development and/or economic growth, depends on many determinant factors. There are many macroeconomic variables that contribute to economic growth, of which export is considered as one of the very important factors that drive a country's economic growth. The economics literature supports the contention that development requires economic growth particularly in developing countries in order to alleviate poverty, and greater access to world markets is perceived as a necessary condition for more rapid growth. The favorable impact of exports on economic growth has been well established in different literature as exports facilitate better offin resource allocation, efficient management style, economies of scale, and efficiency of production (Balassa 1978; Bhagwati 1982; Awokuse 2003). Further, exports enable imports of essential raw materials and capital goods, thus increasing investment in the economy and thereby resulting in higher output (Rana and Dowling 1990).

According to the orthodox classical economist as well to the modern liberal view trade is equivalent to an engine of economic growth. The role of exports in economic development has been widely acknowledged. Ideally exports, activities stimulate growth in many ways, including production and demand linkages, economies of scale due to larger international markets, increased efficiency, adoption of superior technologies embodied in foreign-produced capital goods, learning effects and improvement of human resources, increased productivity through

specialization (Basu et al., 2000; Fosu, 1990; Santos- Paulino, 2000; and Giles and Williams, 2000) and creation of employment.

The cause of poor export performance in all sector in SSA has been attributed to poor domestic policies as well as restrictive policies by developed countries. Furthermore, the ability of the region to increase exports (its export supply response) is constrained by structural rigidities in production capacity, infrastructure and institutional barriers to trade costs followed by overvalued exchange rate and others policies (Biggs, 2007; Kandiero and Randa; 2004; Alemayehu, 1999).

The composition of exports from sub-Saharan Africa has remained relatively constant over time, with a relatively low share of manufacturing as well as services sector exports and high shares of all other export categories (agriculture, food, fuel and ores and metals). However, detailed examination of export activity in SSA is not diversified yet as the world market access condition. Specialagriculture raw materials exports fluctuate over time since it is seasonal and partly dependent on imported inputs such as fertilizers, pesticides, equipment. Thus, balances of payment crisis have caused reduced imports of inputs and equipment perhaps causing a reduction in agricultural production and export of SSA (Cleaver, 1985).

In general, according to (Eugazza, 2004)export performance has varied substantially across the regions, World exports increased by almost 220per cent in the past twenty years. The figure jumps to 720 per cent for East Asian and Pacific countries and falls to 80 per cent for Sub-Saharan countries. The exports of “best performers”, such as the Republic of Korea, China, Cambodia and Viet Nam, have grown by more than 15 per cent annually over the whole period. “Worst performers”, mostly African and Latin American countries, have negative annual growth

rate records in at least one decade. Consequently the level of economic growth has remained relatively low and in some cases stagnant. The export performance of Sub-Saharan Africa (SSA) over the last three decades has not been encouraging. In fact, SSA has lost its share of world exports by over 250% over the last 30 years (Lyakurwa, 1998).

Many of the SSA countries have been experiencing poor export performance. The reason for such performance is the export portfolio of these countries, which depends on particular commodities. Exports of primary commodities account for between 80 and 90 per cent of the total exports of many African countries and the long term decline in prices, variability of export volume, deterioration in the terms of trade, and the instability of commodity markets are said to be major factors that affect export earnings (export performance) and constrain economic growth and poverty reduction in Africa (Adebusuyi, 2004). While developed countries strengthen their exports by concentrating on more value added products, Africa, particularly Sub-Saharan Africa has not been able to move from dependence on the export of primary commodities to manufactured products (Lyakurwa, 1998).

Primary commodities dominate Sub-Saharan African (SSA) exports and they are extremely vulnerable to variations in weather conditions, world demand and prices. Export diversification through promotion of manufactured goods and services exports are generally viewed as an important factor for sustained economic growth. Over the last two decades manufactured goods exports have become a major factor of economic growth in developing countries. A good example is in countries like Argentina, Brazil, Colombia, Indonesia, and Vietnam where manufacturing accounts for 30% to 55% of merchandise exports while in Hungary, Mexico, Pakistan, the Philippines, and Turkey, manufacturing accounts for more than 80% of merchandise exports (Hanson and Roberts, 2007).

If SSA is to enjoy optimum benefit from the integration and opening of the world economy, this heavy reliance on primary products must be reduced, which requires a new and important role for SSA manufacturing industries. Evidence has shown that rapid export growth provided the foundation for industrialization in East and Southeast Asia. In Indonesia, Malaysia and Thailand, while primary exports played a prominent role in the 1960s and 1970s, the share of manufactured exports in total exports rose from 6 percent in 1965 to 41 percent, 61 percent and 77 percent respectively in 1992 but in SSA, the manufacturing share of exports was 7 percent in 1965 and 8 percent in 1990 (Amakom, 2012).

According to Albaledjo (2003), there is no doubt that manufacturing exports remain one of the most powerful engines for economic growth. It can stimulate a more productive agricultural sector, making use of technological advances and a boost in human capital. The industrial sector has been confirmed the main vehicle for technological and human development. Today, the sector represents the hub of technical progress, not just in developed countries but also in developing ones.

Most SSA economies are unstable export performance due to their dependence on primary good like oil and agricultural products. This will be very series special in east African countries since their major export goods are primary. And according to the Prebisch-Singer hypothesis (PSH) primary goods exports face declining terms of trade due to their low value added to manufactured goods and the constant fluctuations in world prices(Prebisch, R., 1950). Therefore, Developing manufacturing capacity and greater diversity of output is also important for the region.

## **1.2. Statement of the problem**

Most developing countries experience a shortage of capital and foreign currency, this is reflected in their respective import-export and savings-investment gaps, which implies that developing countries have insufficient foreign exchange and/or savings to finance their investment needs. To fall this gap the export sectors needs improvement to address financial disturbance. Since it generate foreign exchange which necessary to finance import goods which have a great contribution for investment in different sectors of developing countries.

For about 80 and 90 per cent of the total exports of many African countries are primary commodities and the long term decline in prices, variability of export volume, deterioration in the terms of trade, and the instability of commodity markets are said to be major factors that affect export earnings (export performance) and constrain economic growth and poverty reduction in Africa (Adebusuyi, 2004). Many of the SSA countries have been experiencing poor export performance. The reason for such performance is the export portfolio of these countries, which depends on particular commodities. Most African countries depend on a few primary commodity exports for the bulk of their export exchange earnings, and they have had to contend with the problem of long-term instability of primary commodity prices, which is greater than that of prices for non-primary tradable commodities (UNCTAD, 2003). For poor performance of SSA countries both internal and external factors are responsible.

Africa is the only region in the world to experience a negative growth in commercial services exports, according to new statistics from the World Trade Organization (WTO, 2013). Whereas globally they have been on the rise, Africa has experienced the opposite trend – dropping more than 4 percent from 2012-2013 to \$79.55bn. The WTO's 2013 figures cover 25 out of the 54 African economies. Globally, commercial service exports increased from \$4397bn to \$4644bn

over the same period. Services exports cut across several sectors including tourism and communications, as well as financial, computer and information services. Transportation and travel exports accounted for almost three quarters of total commercial services exports in Africa in 2013 (Ibid). While transportation services exports showed a small annual increase of 2.33 percent, travel has witnessed a decline of over 10 percent in 2013 - a significant factor to the overall fall in commercial services exports (Ibid). However, the success of some countries in exporting services seems to be unrelated to their performance in trade in goods or to their industrial development. In fact, service sector exports of a number of developing countries are growing faster than their goods exports and are contributing to their export diversification. Some authors have suggested a “service revolution” is occurring that offers an alternative channel for accelerated economic growth and poverty alleviation (Ghani, 2010). Developing countries are exporting not only traditional services, such as transportation and travel (or tourism) services, but also modern services, notably high-value, skill-intensive services, such as computer and information services and other business services.

In the words of Bigsten *et al* (2002), the major cause for poor manufacturing export in SSA are a substantial competitive gap and an unclear learning by exporting situation. Therefore, such a gap can be reduced endogenously through increased international trade.

According to Amakom (2012), the development of the SSA manufacturing sector has been seriously stagnated over the same period, except in a few countries like South Africa and Mauritius. The share of manufacturing value added in Gross Domestic Product (GDP) in SSA is 15 percent, which is the lowest share in the world paralleling South Asia. According to Albaladejo *et al* (2004) if South Africa is excluded, which is an exceptionally industrialized country accounting for about 60 percent of manufacturing production in Africa, the figure drops

to 13 percent and well below the average for low income countries of the world. The SSA share of manufacturing exports in total exports excluding South Africa is 21 percent, which is less than half of that in low-income countries.

Comparing the ratio of manufacturing exports to GDP, the average 6 percent is just over half of the average for the low-income countries confirming that in Africa, manufacturing export performance is particularly poor and one of the sources of stagnation in Africa (WB,2006).

Like most Sub-Saharan African countries and other developing countries, EA countries export structure is predominantly composed of agricultural exports commodities. This has made the export sector to be more vulnerable to fluctuations in world prices and become seasonal. Consequently, export growth has been highly volatile in this region, based on fluctuations in earnings from a few traditional agricultural exports.

Earlier studies have provided a number of insights regarding the determinants of export performance special in SSA countries by focus on addressing the problem in different sectors either in the supply side or on the demand side.

However, these studies have not been conclusive enough in the context of EA countries, since EA countries are the LD countries when we compare with North, South and Western African countries in term of economic status and other socio-economic condition of the region it completely differ. And the export performance of most east African countries decline over the and there is no any policy that can give ways to boost the export performance of the region and finding to factors which affect the export (it may be positively or negatively). Therefore, it needs concerted efforts in both industrialized and developing countries to balance this downward movement. And it also needs a special attention to analyze the extent to which factors are

constraining the export sectors (agriculture, manufacture and services) so as to attain sustainable export performance and to increase the sectors contribution of growth process in the region.

### **1.3. Objective of the Study**

The main objective of this paper is to explain theoretically and assess empirically both the demand and supply side factors affecting EA countries total, agricultural, services and manufacture export performance by employing a panel data.

The specific objectives of the study are:

- i. To see the trend of total, agricultural raw materials, service and manufacture export performance in the region.
- ii. To see the determinants (i.e. the demand and supply side) of total export, agricultural, manufacture and services exports in the region.
- iii. To draw some possible policy prescription and recommendation that would maximize the export performance of the region base on the finding.

### **1.4. Significance of the Study**

The main reason for this study was that, researchers have not yet paid enough attention to the export performance of east African countries. Despite export is recognizable as the crucial role for economic growth and the means for improving the current account balance still not give emphasis. Therefore, identifying the determinants of export growth rate will help provide information to policymakers to enable them come up with the appropriate policy regarding the growth of the sector and the economy as a whole. This study is expected to add new knowledge to the existing literature, as it comes from EA countries. Therefore, apart from getting current

research findings, the study also provides the room for comparison among developing countries with the previous research findings for further studies.

### **1.5. The Scope and limitation of the Study**

The scope of the study was limited to see the impact of FDI Foreign direct investment (FDI) net inflows, GDP growth rate, Real effective exchange rate (CPI based), average income of major export destinations of the country  $i$  time  $t$ , human capital proxy by building human resources assesses the national policies and public and private sector service delivery that affect the access to quality of health and education services, including prevention and treatment of HIV/AIDS, tuberculosis, and malaria.

Institutional quality proxy by government effectiveness which reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.

Landlocked Dummy (1 if land locked 0 if not), and WTO Dummy (1 if member 0 if not) on exports of goods and services (% of GDP), agricultural raw materials exports (% of merchandise exports), Service exports (current US\$) and manufactures exports (% of merchandise exports) from the period 2005 to 2014 for seven countries in the sample.

The rationale behind taking ten years data (i.e. started from 2005) was that to include more countries in the region. This is intended to increase the sample of the study (i.e. seven countries were selected), but Eritrea, Djibouti, Somalia, South Sudan were not included in this study due to absence of data over the period.

Data like infrastructure and research and development are not accessible for almost all countries in this region. Because of this we cannot observe the impact of those variables in export performance.

The descriptive and empirical analysis we use secondary sources of data from world banks and UNCTAD.

### **1.6. Organization of the study**

The research report was organized under five chapters. The first chapter provides the general overview of the study. The general information included in this chapter; background of the study, statement of the problem, objective of the study, research methodology, scope of the study and significance of the study as well as organization of the study. The second chapter reviewed the related literatures on the determinants of export performance in the region. The third chapter focuses on the methodology of the study and the fourth chapter was provided results and discussion. The final chapter included summary, conclusion, recommendations and room for further research and at the end references and appendixes were attached.

## CHAPTER TWO

### Literature review

#### 2.1. Theoretical Models of Export Determination

Theoretically, identifying the export performance of a country or the region under the assumption of imperfectly substitutable goods and services, which having different quality, type and country of origin should describe the realistic of export of goods and services.

King (1997) try to identified different types of models to explain the link between a given country's exports to the rest of the world and most researchers apply to see the export performance of a country or a region under consideration. These are the export demand model, export determination models, and two-regime models.

##### 2.1.1. Single Equation Export Demand Model

The export demand model is simplest ways of analyzing the demand side determinant of the export performance of a country or the region by assuming the supply side to be perfectly elastic. According to (King, 1997) this model assumes that the supply side either has an idle productive capacity or else the economy exhibit increasing returns to scale. It is also assumed that the price elasticity of supply of exports tends to be infinity but these assumptions of increase return to scale or the assumption of full productive capacity does not suit the export sector of SSA. In most developing countries most of the constraint comes from the export sector are associated with supply side factors. In addition, export is found to be highly inelastic for their export. Since this model works under highly restrictive assumptions, it cannot be taken for the establishment of the model for developing countries exports within this framework. Because of this reason researchers limit themselves from using single equation model to explain the export sector for developing countries.

### **2.1.2. Export Determination Models**

The export models are established by combining the theoretical assumption of export demand and export supply model that would be estimated as a single equation using common ordinary least square (OLS) King, 1997).

According (King, 1997) as cited by Ibrahim domestic demand pressure (DDP) concedes as a potential explanatory variable which helps to analyze the implication of domestic activity over export for a country or the region. Therefore, as DDP changes as result income also changes. If incomes increase due to increasing of DDP, it calls for hiring laid-off staff and bring stand by equipment, hiring new workers and increase in employment. The impact of profitability over exports also related to DDP. So, theoretically including DDP as well as profitability indicator in the supply equation of the export determination model is assumed to capture the supply side variables impact on agriculture, services as well as manufacture export performance of a country or the region.

### **2.1.3. Two-Regime Model**

The two-regime models are constructed on the assumption that either exporters are not simply a collection of homogeneous firms and/or the environment which they operate may exhibit fundamental change from time-to-time. The exports of EA countries are primary commodity exports with little product differentiation. In addition, for centuries almost all EA countries were engaged in trading of in a very small manufactured and non -processed primary commodities and service sector. The economies of most of the countries are static both in production and in trade. Thus, the model is not fitted to explain the export sector of developing countries and nothing is done empirically for its bold assumption. This study would be adopted in modeling total export,

agricultural raw material export, service export and manufacture export of EA in this study. Detailed explanation on this model will also be give the next chapter

## **2.2. Export Performance in Developing Countries**

### **2.2.1. Agricultural Export Performance in Developing Countries**

According to Mold and Prizzon (2008) the share of African trade performance in world merchandise trade, measured in value terms, has declined steadily since 1980, from around 6 per cent to around 2 per cent in the late 1990s, with a subsequent mild recovery in the 2000s to around 3 percent. Others argue that African countries' domestic policies led to the decline in the region's share of global exports. In the 1980s, policies such as exchange rate appreciation and anti-agricultural industrial policies were some of the dominant domestic policies that contributed to the deterioration in agricultural export performance (Schiff and Valdes, 1992, Yeats *et al.*, 1997).

Morrissey (2005) argues that despite African trade has decline, this does not mean that trade is unimportant for Africa. Therefore, exports are very important to African countries even if African exports are not that much important and influential in the world market. Therefore, export has a significant role the stability of the developing country economy.

Market access condition is one of major factor that determines the export performance of a given country (Fugazza, 2004; UNCTAD, 2005). The IMF and World Bank (2002, p. 21), improved market access for Africa's exports alone will not be sufficient to engender a sustained growth performance, but should form part of a broader strategy to promote a vigorous supply response for export performance of the Continent. There is evidence that indicates that impediments to trade in agricultural products remain far greater than in manufacturing trade. Different literature has also shown that in addition to market access condition, supply capacity condition is an

important for the development of a country's export sector (Redding and Venables, 2003; Fugazza, 2004).

Almost from all sectors agriculture is an important for sustaining growth and reducing poverty in developing countries. Therefore, its growth and development are essential for overall process of socioeconomic development of developing countries. Because agriculture is the sources of food and this sector dominates most developing countries' economies in terms of contribution to GDP, employment and income, (Wilfrid and Edwige, 2004). According to Alwang and Siegel (1994), the international trade of SSA countries is mainly based on exporting primary agricultural commodities in which they have comparative advantage due to cheap labor and tropical climate.

Due to countries domestic policies, seasonal based agriculture activity, and restrictive policies of developed and other export constraint such as structural rigidities in production capacity, infrastructure and institutional barriers to trade costs followed by overvalued exchange rate and anti-agricultural industrial policies most of SSA countries has been exercised with poor export performance in agricultural sector is (Biggs, 2007; Kandiero and Randa; 2004; Geda, 1999).

When we evaluate the African export performance According to the trade theory of comparative advantage, Africa continues to produce and export its raw materials or primary goods, where it is said to have the comparative advantage. But the comparative advantage theory is has been disappointing as African countries have been forced into the role of exporting raw material and other primary commodities with little or no development impact (Tesfaye, 2014).

African agricultural production is largely subsistence in nature with a high dependence on the rain; farmers suffer price competition with large scale farmers in more developed countries who flood their products in Africa while export capacity of locally produced agricultural products

from Africa is very limited (Mkpado, 2013). Other worrisome agricultural characteristics and trends shared by African countries include high degree of production variability, relatively low crop yields and dependency on primary exports with low income elasticity and high price volatility. Relative to other developing regions, Africa's agriculture is undercapitalized, uncompetitive and underperforming; the sector is relatively weak as its productivity lags behind that of other regions and often declining performance is symptomatic of the myriad challenges it faces. Similarly most of Sub-Saharan African countries depend almost on primary commodities for their foreign exchange earnings.

According to Ibrahim (2007), in developing countries, especially Sub-Saharan African (SSA) countries, pattern of exportable goods is dominated by primary agricultural products and for export of processed and semi processed agricultural products there is limited access to the international markets. Moreover the countries are facing decline in the prices of primary goods in the international market. However, LDCs basic focus was only to solve problems related to supply side bottleneck without paying much attention to the demand side problems or in some cases taking the demand side for granted. The export sector of SSA is highly affected not only by domestic policies but also by international policies including the performance of the world economy, the rules established by different international organizations such as world trade organization(WTO) and other exogenous factors like institutions, governments' commitment, natural resource and intensity and prevalence of poverty.

Various discussions on SSA's trade normally cover issues of unfair market access and problems concerning the market-distortive effects of developed subsidies. Yet one of the greatest challenges facing Sub-Saharan African countries today is overcoming supply side constraints and building competitive capacity within the private sector. Over the past 30-40 years SSA's

share in world exports has been declining and along with it the standard of living of most Africans. Yet during the same time, other developing countries, in particular in Asia, have experienced significant growth in their share of world exports (Calvin M., 2005). In this study we will use agricultural raw material export (%of merchandise export) mean that food and mining export do not include for easily handling the analysis part of it and it will be concenter by the next researchers.

### **2.2.2. The Services Sector Export Performance in Developing Countries**

Trade in services has become a dynamic component of trade as well as an alternative for export diversification in developing countries. Increasing tradability allows the cross border exchange of services, such as professional services, that previously required the close proximity of providers and consumers (Ghani, 2009; Ghani and Kharas, 2010). During 2000 – 2007 that is before the financial crisis trade in services grew as fast as trade in goods, at an average rate of 12 percent annually. A large number of developing countries have successfully exported services both within their own regions and to high-income countries. India's success is well known: exports of software and business process services account for approximately 33 percent of India's total exports. Brazil, Costa Rica, and Uruguay export professional and information technology–related services; Mexico exports communication and distribution services; and Chile exports distribution and transportation services (Saez and Goswami, 2010).

According to Saez and Goswami, there are differences in the patterns of service among developing regions. In South Asia, services exports are mainly concentrated in cross-border services, and within this mode, in information and communications technologies (ICTs), communication services, and ICT-enabling services (cross-border provision of business and professional services, among others). In East Asia, services exports are closely linked to

manufacturing exports. This may provide opportunities in the future to diversify into new activities not linked to trade in goods for these countries.

In Latin America, exports tend to be more concentrated on services that are supplied through direct investment in other countries in the region. For instance, 61 percent of Chile's investment abroad is in services and energy industries mainly in neighboring countries. Although Brazil's outward investment is much more diversified both in terms of sectors and markets, services play an important role. In financial, construction, and engineering services, Brazil has been a successful exporter via. Investment abroad Likewise, Mexico's outward direct investment is diversified in terms of sectors and countries, but services play an important role in telecommunications, distribution, call center activities, and offshoring.

Although services export is vital for Africa countries, still there is no clear trade pattern. Therefore, Services have been also emerging as an important trade topic. After meanwhile African countries try to participate. Such as Morocco, Tunisia, Kenya, and South Africa provide professional services to Europe, and Egypt has developed a world-class call center sector.

It is not an easy task to evaluate the quality of services sector special in developing countries due to its unique characteristics- intangibility, heterogeneity, and inseparability (Berry and Parasuraman, 1991). According to Parasuraman et al. (1985) proposed a framework consisting of ten determinants or dimensions of service quality: reliability, access, understanding of the customer, responsiveness, competence, courtesy, communication, credibility, security, and tangibility considerations.

Malhotra et al (1994) used these dimensions as a basis for a comparative evaluation of the determinants of services quality and between developed and developing countries. Developing countries benefit not only from increasing their exports of services, but also from gaining access

to services not available domestically (Braga, 1995). For some developing countries, services are a major foreign exchange sources. Moreover, many services provide the infrastructure that is necessary for the rest of the economy. Foreign direct investment is intimately linked to services because many developing countries suffer from shortage of capital and qualified human resources.

Developing countries are exporting not just traditional services, such as transportation and travel (or tourism) services, but also modern services, notably high-value, skill-intensive services, such as computer and information services and other business services. The success of some countries in exporting services seems to be unrelated to their performance in trade in goods or to their industrial development. In fact, service sector exports of a number of developing countries are growing faster than their goods exports and are contributing to their export diversification.

Some authors have suggested a “service revolution” is occurring that offers an alternative channel for accelerated economic growth and poverty alleviation (Ghani, 2010). At the start, clarifying certain aspects of trade in services is helpful (Copeland and Mattoo 2008; Francois and Hoekman, 2010). Because many service transactions require face-to-face contact between the consumer and the provider, despite the increased scope for electronic delivery.

Barriers to trade in services are more complex than are barriers to trade in goods. The empirical literature confirms that service sector performance critically depends on human capital, the quality of the telecommunication network, and the quality of institutions. The gravity framework has been widely used to explore the determinants of trade in services. Results of gravity models suggest that human capital skills and electronic infrastructure are important determinants of trade in services (Lennon 2006; Lennon, Mirza, and Nicoletti 2009; Shingal 2010). The literature also suggests that the quality of institutions, as measured by the degree of corruption, complexity of

export procedures, and rigidity in employment law (Lennon 2006), or the economic freedom index (Kimura and Lee 2006) also positively influence trade in services.

Identifying the reasons for the success or underperformance of developing countries in exporting services remains challenging because of the lack of reliable data. Mattoo (2005) and Maurer and others (2008) describe some of the inadequacies in the data relating to trade in services. Service exports conform in certain respects to the predictions of the theory of comparative advantage with some degree of factor specificity. Broadly, a country's exports of services depend on its endowments at any time of infrastructure, factors of production, and institutions relevant to services, in comparison to its endowments of these factors relevant to manufacturing. However, this is not as need of it in SSA country special in EA country it is still infant.

### **2.2.3. The Manufacture Export performance in developing Countries**

According to Morrissey et.al (1998) recent years have witnessed a noticeable increase in research on manufacturing enterprises in Africa, and a number of reasons can be suggested for this. First, prior to the widespread adoption of SAPs in the 1980s, industry in most African countries was dominated by the parastatal sector; the private sector tended to be small and comprised mostly micro-enterprises (which were often effectively informal sector).

Privatization has meant that private sector enterprises have become economically more important. Second, and related, trade liberalization is intended to encourage exports, including of manufactures; one obvious reason for the slow response of manufacturing to liberalization is that it takes time for the sector to establish itself before exporting is likely. It is not generally the case that producers can quickly shift from domestic markets to export markets if anti-export bias is removed. With the possible exception of those exporting within the region, the product characteristics and marketing information required differ between domestic and export markets.

Third, and perhaps most important from the research perspective, only recently have large-scale surveys of manufacturing in Africa become available for analysis. At the forefront of this is the World Bank and bilateral donor-sponsored Regional Programme on Enterprise Development, which has funded surveys in a number of African countries.

Two studies compare results from panels of firms for four African countries: Cameroon, Ghana, Kenya and Zimbabwe. Bigsten and others (1997a) use panel data for a total of 502 firms over 1991-95 to try and identify the determinants of exporting, estimating equations for the decision to export and the share of output exported. They find that most large firms export (71 per cent on average over the four countries), but export a small proportion of output (28 per cent on average); 35 per cent of medium-sized firms export on average, but only about 20 per cent of output. No factors other than size consistently influence the decision to export. Given that a firm exports, the only factor that seems to be associated with a higher share of output exported is being in the Wood group (except for Kenya, where it is Food). In a related study, Bigsten and others (1997b) use panel data for a total of 714 firms over 1992-95 to estimate an investment function for each country, taking into account effects for firm size. Profit appears to be the only consistent determinant of investment, especially for small firms, although the effect is small. Teal (1995) obtains similar results for a panel of some 200 firms over 1991-93 in Ghana.

Parker *et al* (1995) present the results of a survey of 303 firms over 1989-91 in five countries: Ghana, Malawi, Mali, Senegal and Tanzania. While they were interested in the characteristics of entrepreneurs, asking questions about sources of start-up capital and constraints on exporting, some of their findings are relevant. In cases where the survey we analyse asked comparable questions, we compare the results with those of Parker *et al* (1995).

### **2.3. Overview of African export performance**

Based on World Bank (WB) and International Monetary Fund (IMF) the major issue that concenter in the theory of trade policy is creating a more liberalized trade system for the rest of the world, but Many African leaders have called for further trade liberalization. But, although they urge an end to protectionist policies in the developed world, African leaders refuse to open their own markets to foreign competition.

According to Ibrahim (2007) export sector of SSA Countries are highly affected not only by domestic policies but also by international policies including the performance of the world economy and other exogenous factors like institutions, governments' commitment, natural resource and intensity and prevalence of poverty.

Sub Saharan African agriculture is currently facing challenges in international trade with respect to external market access conditions and competition in world markets as a result of trade liberalization efforts under the world trade organization (WTO) agreements and in particular the agreement on agriculture (AOA) (*Nyangito, 2004*). According to (UN, 2014) Africa's exports are projected to decline further to 27.5 per cent of GDP in 2014, in all sub regions except East Africa they show a slight gain is observed owing to increasing non-traditional exports such as floriculture and trade in services, especially in Ethiopia, Kenya.

Kose and Riezman (2001) estimated that African economies "export on average 54 different goods. This number is around 213 for the G7 countries. This shows lack of product diversification in African exports. Similar study by (Songwe and Winkler, 2012) also confirmed. Therefore, to boost its trade and sustain GDP growth, Africa must diversify its exports. Although Africa's exports have generally kept growing in absolute terms, they showed declines in 2013 relative to aggregate output and, although the volume of African merchandise trade grew faster

than that of non-African economies from 2011 to 2012, Africa's share of world exports is still low. In 2012, the continent accounted for just 3.3 percent of world merchandise exports (UNCTAD, 2013c) – as against 4.9 per cent in the period 1970-1979, although a little better than the 2.8 percent seen in 2000-2010 (UNCTAD, 2013). Even if trade between Africa and its traditional partners (the European Union and the United States) has continued to increase in recent years in absolute terms, Africa is diversifying its sources of imports and export destinations in favor of developing economies.

Between 2000 and 2012, Africa's share of total world exports to developing countries increased from 2.6 per cent to 3.8 percent, (UN, 2014). Formal intra-African trade in merchandise is rising but informal trade remains significant. High commodity prices largely explain this, as Africa's trade with the rest of the world is skewed towards primary commodities (dominated by minerals, oil and other metal products), unlike intra-African trade (UNCTAD, 2013). Informal intra-African cross-border trade is not recorded but is nonetheless significant, accounting for 30-40 per cent of total trade within the Southern African Development Community (SADC).

Agricultural trade offers opportunities for accelerating economic growth and rising incomes of smallholder farmers in poor countries (FAO, 1995). Africa's share of world agricultural trade has increased steadily in recent years, with its share in agricultural exports rising from 1.2 percent in 1996–2000 to 3.3 percent in 2009-2013 (UNCTAD, 2014)

#### **2.4. Empirical literature review**

In this section we will try to show empirical studies related to this study, by overviewing the objective, methodologies and findings.

Agriculture employs 62% of the population of SSA (excluding South Africa) and generates 27% of GDP of these countries, with the majority of the poor living in rural areas (FAO, 2006; World

Bank; 2006b as cited in Staatz and Dembélé, 2007 and Tesfaye, 2014). However the continent still accounts for a very low share of world trade

Fugazza (2004) as cited in Beshir (2010) analyzed the major determinants of export performance in 84 countries by employing an econometric model of bilateral trade flows using gravity techniques. The result shows that, while trade barrier continue to be concern, supply-side conditions have often been the most important constraint on export performance in various regions particularly in Africa, despite generalized deepening of international trade integration.

In 1990, about 50 percent of total FDI stock in services sector (Trade and Development Center, 2003). They determine the complementarity or substitutability between service exports and outward FDI in services by regressing FDI residuals obtained from an FDI equation on service exports residuals obtained from the service exports equation. The coefficient for service exports residuals is found to be positive and significant at the 1 percent level, implying that outward FDI and service exports are complementary. This finding is interesting because a large proportion of trade is facilitated through foreign affiliate sales. The literature also suggests that FDI may be detrimental for exports if it lowers or replaces domestic savings and investment or transfers technologies that are low level or inappropriate for the host country's factor proportions. Furthermore, if host countries do not meet the threshold human capital requirement (see, for instance, Blomström and Kokko 2003) or if most service exports are low in capital intensity, FDI may not influence service sector exports in a significant way.

Since the mid-1990s, service exports of 20 developing countries including not just Brazil, India, the Russian Federation, and China, but also Cambodia, Ghana, Morocco, and Nigeria have grown by over 15 percent annually. From 1990 to 2007, before the financial crisis, the average growth of service exports was about 8.7 percent for high-income countries, 10.0 percent for low-

income, and 13.0 percent for lower-middle-income countries. The share of developing countries in exports of world services increased from 11 percent in 1990 to 21 percent in 2008.

Bigsten *et al* (1997a) find that foreign ownership has a positive and significant impact on the decision to manufacture export in Kenya and Zimbabwe but not in Cameroon and Ghana. They find no evidence of foreign ownership affecting the percentage of output exported.

When we see the export performance of the East African countries, there is no research about the export performance of the region. Therefore, this paper can give some evidence about the region export performance and its trends.

## Chapter three

### Data Description and Methodology Computable

#### 3.1. Data Sources and Sampling Procedure

**Data Sources:** To attain the above objectives this study utilizes secondary data which collected from different sources depending on the availability of data and interest of the study. The research paper will use full panel data for seven East Africa countries based on its relevance and the number of variables available in the data set.

**Sampling Procedure:** In line with the objective of this study, Sampling procedure is a process or technique of choosing a sub-group from a population to participate in the study; it is the process of selecting a number of country for a study area in such a way that the individuals countries are selected represent the large group from which they were selected (Jaeger, 1988). . . But this study follows a total population sampling technique which is a type of purposive sampling technique where we choose to examine the entire region in East Africa countries. Seven countries selected based on the availability of data for each sectors of export (agriculture, services and manufacture).

#### 3.2. Model Specification

In modeling the export performance of any sectors of the economy, many authors used the work of Goldstein and Khan (1978) as benchmark. Similarly, this study use this model by adjusting some of variables. The study specified the demand and supply equation for total export and by sectors (i.e. total export, agricultural raw materials export, manufacture and service export).

### 3.3. Equilibrium model

According to this model there is an assumption that there is no lag in the system so that the adjustment of export quantities and prices to their respective equilibrium values is instantaneous. The foreign demand for an individual country's exports (for all sectors) is specified in log-linear form as follow.

$$\log X_{it}^d = a_0 + a_1 \log(PX/PXW)_{it} + a_2 \log YW_{it} \dots \dots \dots (3.1)$$

Where,  $X^d$  = quantity of expot demanded, PX = price of exports, PXW = weighted average of the export price of the country's trading partners and YW = weighted average of the real income of the country's trading partners. Since the model is specified in logarithm form, the coefficients represent elasticities where by  $a_1$  will be expected to be negative and  $a_2$  is positive. In contact to the usual income effect, an increase in world income might be associated with faster growth in the production of agricultural goods, industrial product and service sector than in the consumption of imported goods and services from all sectors,  $a_2$  would have negative expected coefficient.

The supply of exports is specified as a log-linear function of the relative price of exports (i.e., the ratio of export prices to domestic prices) and of an index of the productive capacity of the country:

$$\log X_{it}^s = \beta_0 + \beta_1 \log(PX/P)_{it} + \beta_2 Y_{it}^* \dots \dots \dots (3.2)$$

Where,  $X^s$  the quantity of exports supplied, PX = price of exports, P = domestic price index and  $Y^*$  = logarithm of an index of domestic capacity to produce.

Equation (3.2) is the general model of export supply in this study. This specification assumes that the firms are the price takers and postulates that supply of exports is attributed to relative

prices of export and domestic inputs. The model embodies the hypothesis that as the exports prices increases relative to domestic input prices, exports activities will be more profitable, and accordingly, exporters will have an incentive to supply more. In addition, exports are conjectured to rise, when there is an increase in country's capacity to produce, which represents any advances in factor supply, infrastructure, and total factor productivity in the economy.  $\beta_1$  and  $\beta_2$  are assumed to be positive in the results since a rise in the price of relative to domestic price, production for export becomes more profitable.

The Equation (3.2.) can be normalized for the price of exports,  $PX_t$ , to yield:

$$\log PX_{it} = b_0 + b_1 \log X_{it}^S + b_2 Y_{it}^* + b_3 \log P_{it} \dots \dots \dots (3.3)$$

Where,  $b_0 = -\frac{\beta_0}{\beta_1}$ ;  $b_1 = \frac{1}{\beta_1}$ ;  $b_2 = -\frac{\beta_2}{\beta_1}$ ;  $b_3 = \frac{\beta_1}{\beta_2}$  and  $b_1 > 0$ ,  $b_2 < 0$  and  $b_3 > 0$

Equation (3.2.) and (3.3) constitution of equilibrium model, and estimates of the structural parameters can be obtained by estimating these two equations simultaneously.

### 3.4. Disequilibrium Model

To capture dynamic behavior among the observed variables within the demand and supply models for exports, we utilize the adjustment mechanism suggesting that exports do not adjust instantaneously. To their long-run equilibrium level following a movement in any of their determinants argued that such a non-instantaneous adjustment is due to several reasons, namely the significant distances between the suppliers and the buyers exist. Consequently, not only delivery times are expanded, but also, information regarding desires of suppliers and buyers are known only with lags supplies of imported goods are contracted over a period of time, thus, the foreign consumers as well as domestic suppliers may not respond immediately to changes in prices, costs and/ or incomes.

Following [3.4], export quantities are assumed to adjust to the discrepancy between world demand for country's exports in the current period and the actual flow of exports in the previous period. This implies that quantity of exports adjusts to conditions of excess demand in the rest of the world. Meanwhile for supply model, using supply- price specification, the price of exports is assumed to adjust to conditions of excess supply. These, disequilibrium models of demand and supply are as indicated in Equations (3.4) and (3.5), respectively.

$$\Delta \log X_{it} = \gamma [\log X_{it}^d - \log X_{it-1}] \dots \dots \dots (3.4)$$

$$\Delta \log PX_{it} = \lambda [\log X_{it} - \log X_{it}^s] \dots \dots \dots (3.5)$$

Where,  $\gamma$  and  $\lambda$  are coefficient of adjustment (assume to be positive) and  $\Delta$  is a first difference operator In Equation (3.5), it implies that an increase in excess supply will reduce the price of exports. On the other hand, a decrease in excess supply will facilitate the price of exports to rise.

Substituting Equations (3.1) to (3.4) yields the following disequilibrium export demand equation:

$$\log X_{it} = c_0 + c_1 \log PX_{it} - c_1 \log PXW_{it} + c_2 \log YW_{it} + c_3 \log X_{it-1} \dots \dots \dots (3.6)$$

Where:  $c_0 = \gamma\alpha_0, c_1 = \gamma\alpha_1, c_2 = \gamma\alpha_2, c_3 = 1 - \gamma$

The average time lag in such exports adjustment is equal to  $\gamma^{-1}$  and can be drive from the parameter estimates of Equation (3.6) as  $\left(\frac{1}{1-c_3}\right)$ .

Likewise, by substituting Equations (3.3) to (3.5) yields the following disequilibrium export price in supply equation:

$$\log PX_{it} = d_0 + d_1 \log X_{it} + d_2 \log P_{it} + d_3 \log Y_{it}^* + d_4 \log PX_{it-1} \dots \dots \dots (3.7)$$

Where,  $d_0 = \frac{-\lambda\beta_0}{(1+\lambda\beta_1)}, d_1 = \frac{\lambda}{(1+\lambda\beta_1)}, d_2 = \frac{\lambda\beta_1}{(1+\lambda\beta_1)}, d_3 = \frac{-\lambda\beta_2}{(1+\lambda\beta_1)}, d_4 = \frac{-\lambda\beta_3}{(1+\lambda\beta_1)}$

Therefore, based on the above discussion, the world demand side determinants of the export performance of K (total export, agriculture, manufacture and services) from East African countries i in year t can be specified in a log linear form as:

$$\text{Log } XD_{it}^K = a_0 + a_1 \ln \text{MEXD}_{it} + a_2 \ln \text{REER}_{it} + \text{WTOM}_{it} + \varepsilon_{it} \dots \dots \dots (3.8)$$

Where,  $XD_{it}^K$  = Exports as a percentage of GDP for K (total export, agriculture, industrials, and services) demanded from country i in year t.

$\text{MCEXI}_{it}$  = Average Income of Major export destinations of the country i time t.

$\text{REER}_{it}$  = Real effective exchange rate of country i in year t.

$\text{WTOM}_{it}$  = WTO Dummy (1 if member 0 if not) and  $\varepsilon_{it}$  is the error term which capture variables which do not consider in this study.

In demand equation, there is an important issue that should be conceder for export of those goods and services that is small countries hypothesis. If a country is truly a price taker (country like East African countries), then the price of goods and services will be exogenous variables. This is the most common economic phenomenon, particularly in East African countries.

The supply side determinants of the export performance K (total export, agriculture, industrials and services) from East African countries i in year t will be specified in a log linear form as:

$$\begin{aligned} \ln XS_{it}^K = & \beta_0 + \beta_1 \ln \text{GDPG}_{it} + \beta_2 \text{AINITQ}_{it} + \beta_3 \ln \text{FDI}_{it} + \beta_4 \ln \text{LDLK}_{it} + \beta_5 \ln \text{HC}_{it} \\ & + \beta_6 \ln \text{DOP}_{it} + \varepsilon_{it} \dots \dots \dots (3.9) \end{aligned}$$

Where,

$XS_{it}^K$  =Exports as a percentage of GDP, K (total export, agriculture, manufacture and services)

$\text{GDPG}_{it}$  = GDP growth rate (growth annual %).

$AINITQ_{it}$  = refers to Institutional quality: Institutional quality. As reported in World Governance Indicators (WGI), there are six measures namely: government effectiveness (GE), regulatory quality (RQ), voice and accountability (VA), rule of law (RL), political stability and absence of violence (PS), and control of corruption (CC). However, in this study we use average of all indicators. The data were sourced from WGI. This indicator is standardized on a scale from -2.5 (lowest) to +2.5 (highest).

$FDI_{it}$  = Foreign direct investment net inflow

$AIINFR_{it}$  = Internal Infrastructure of EA countries at time t (by proxy road construction in km)

$LDLK_{it}$  = Landlocked Dummy (1 if land locked 0 if not)

$HC_{it}$  = Human capital for country i at time t. proxy by building human resources assesses the national policies and public and private sector service delivery that affect the access to and quality of health and education services, including prevention and treatment of HIV/AIDS, tuberculosis, and malaria.

$DOP_{it}$  = Trade (% of GDP) which is the sum of exports and imports of goods and services measured as a share of gross domestic product.

Finally, we can formulate the overall reduce form of the model from equation (3.8) and (3.9) as follow:

$$EX_{it}^K = XD_{it}^K + XS_{it}^K \dots \dots \dots (3.10)$$

Where,  $EX_{it}^K$  export performance of K (total export, agriculture, manufacture, and services) of East Africa Countries.  $XD_{it}^K$  the demand side determinants and  $XS_{it}^K$  the supply side determinants To examine the determinants of export performance of K (total export, agriculture, manufacture, and services) of East Africa Countries, the researchers were used the fixed and random effect model after test the validity of assumption of the model by using Hausman test (verbeek, 2004;

p. 352). This study uses a panel regression technique to analysis the export performance of the region by sectors. The general model will be estimated in the following linear form:

$$EX_{it}^K = \alpha_i + \beta X_{it} + \varepsilon_{it} \dots \dots \dots (3.11)$$

Where,  $EX_{it}^K$ = export as a percentage of GDP and K can be total export, agricultural sector export, services sector export, industrial sector export.  $X_{it}$ = the potential explanatory variables from supply and demand sides.  $\beta$ is coefficient for the representative variables for each sectors export performance.  $\varepsilon_{it} = v_i + u_{it}$  ,  $\varepsilon_{it}$ is the disturbance with  $v_i$  unobserved individual country specific effect and  $u_{it}$  the idiosyncratic error or varies over time and entities.  $\varepsilon_{it}$ is the usual error component which is assumed to be independent and identically distributed over individuals country and time, with mean zero and variance  $\sigma_\varepsilon^2$  ( $\varepsilon_{it} \sim \text{IID}(0, \sigma_\varepsilon^2)$ ) (verbeek, 2004).

Generally, we can reduce the model in the following functional form of export performance of K (total export, agriculture, industrials, and services) by capturing those factors from the demand and supply sides determinants of the country i in year t.

$$\ln EX_{it}^k = f(\ln AMEXDI_{it} + \ln FDI_{it} + \ln REER_{it} + \ln DOP_{it} + \ln GDPG_{it} + \ln AINITQ_{it} + \ln HC_{it} + \ln LDLK_{it} + \ln WTOM_{it}) \dots \dots \dots (3.11)$$

Having the above concept of model specification and considering all possible determinants we can formulate the functional form of total export, the service sector, the industrial sector and agricultural sector export performance of the region as follow.

**MODEL ONE: Total export as the dependent variable**

$$\ln EX_{it} = f(\ln AMEXDI_{it} + \ln FDI_{it} + \ln REER_{it} + \ln DOP_{it} + \ln GDPG_{it} + \ln AINITQ_{it} + \ln HC_{it} + \ln LDLK_{it} + \ln WTOM_{it}) \dots \dots \dots (3.12)$$

**MODEL TWO: Agricultural export as dependent variable**

$$\ln AGE_{it} = f(\ln AMEXDI_{it} + \ln FDI_{it} + \ln REER_{it} + \ln DOP_{it} + GDPG_{it} + AINITQ_{it} + \ln HC_{it} + LDLK_{it} + WTOM_{it}) \dots \dots \dots (3.13)$$

**MODEL THREE: Services export as the dependent variables**

$$\ln SEX_{it} = \ln AMEXDI_{it} + \ln FDI_{it} + \ln REER_{it} + \ln DOP_{it} + GDPG_{it} + AINITQ_{it} + \ln HC_{it} + LDLK_{it} + WTOM_{it} \dots \dots \dots (3.14)$$

**MODEL FOUR: Manufacture export as the dependent variables**

$$\ln MEX_{it} = f(\ln AMEXDI_{it} + \ln FDI_{it} + \ln REER_{it} + \ln DOP_{it} + GDPG_{it} + AINITQ_{it} + \ln HC_{it} + LDLK_{it} + WTOM_{it}) \dots \dots \dots (3.15)$$

Where,

$EX_{it}$  = Total export as a percentage of GDP

$AEX_{it}$  = Total agriculture export as a percentage of GDP

$SEX_{it}$  = Total service export as a percentage of GDP

$MEX_{it}$  = Manufactures exports (% of merchandise exports)

The equation (3.12 - 3.15) will be simultaneously estimated to see the implication of both demand and supply side factors that are expected to affect the export performance. Thus, these models will be used to see the impact of those macroeconomic variables which is conceder as the independent variable in the estimation stage. Before we are going to see the estimation certain estimation techniques will be discuss.

### 3.5. Techniques of Estimation

It is important to know the nature of the data in order to determine appropriate techniques of estimating those models (i.e. from equation 3.12 – 3.15). For having this, we start for checking the stationarity of the variables, diagnostics test (i.e. test of assumption of classical linear regression model) such as test of normality, multicollinearity, heteroscedasticity and autocorrelation assumption. Finally based on the Hausman test fixed and random effect model selected and estimation result will explain according to Stata output.

### 3.6. Definition of the variables

**Foreign direct investment:** - Refers to direct investment equity flows in the reporting economy.

It is the sum of equity capital, reinvestment of earnings, and other capital. Direct investment is a category of cross-border investment associated with a resident in one economy having control or a significant degree of influence on the management of an enterprise that is resident in another economy.

**Real Exchange Rate:** - A fall in the relative domestic prices due to exchange rate depreciation, which makes exports cheaper in international markets and, hence result in increased demand for exports. Therefore we expect positive impact of real exchange rate on export growth.

**Trade openness:** - is a measure of economic policies that either restrict or invite trade between countries. For example, if a country sets a policy of high trade tariffs, thus restricting the desirability of international trade, this restrictive policy will inhibit other countries from sending exports and accepting imports from that country. According to dominating economic theory, this restrictiveness, this lack of trade openness, will have an economic effect of slowing economic development/growth. Conversely, according to economic theory, trade openness will have an economic effect of increasing economic development and growth. According to Fischer

(2003), globalization is defined as the ongoing process of greater economic interdependence among countries reflected in the increasing amount of cross-border trade in goods and services, the increasing volume of international financial flows and increasing flows of labor”.

**Institutional quality:** -It is widely accepted that regions with sound formal and informal institutions create more robust environments for export performance. As reported in World Governance Indicators (WGI), there are six measures namely: government effectiveness (GE), regulatory quality (RQ), voice and accountability (VA), rule of law (RL), political stability and absence of violence (PS), and control of corruption (CC). However, in this study we use the average of all world governance indicators. The data were sourced from WGI. This indicator is standardized on a scale from -2.5 (lowest) to +2.5 (highest).

**Human capital:-** In this study human capital proxy by on the national policies as well as public and private sector service delivery that affect the access to and quality of health and education services, including prevention and treatment of HIV/AIDS, tuberculosis, and malaria. Economist Theodore Schultz invented the term in the 1960s to reflect the value of our human capacities. He believed human capital was like any other type of capital; it could be invested in through health, education, training and enhanced benefits that will lead to an improvement in the quality and level of production. Therefore, it expected to have positive impact on the export performance.

**Landlocked Dummy:** - landlocked countries usually are expected to have poor export performance in all sectors (agricultural, service and manufacture) relative to coastal inferior performance in diversification than coastal countries. Because of their geographical positioning, landlocked countries will have limited access to the international market than coastal counterparts.

**WTO Dummy:** - Genuinely, WTO members are generally expected to have good opportunity to access to the international market and to be competent with the rest of the world. In addition, members of the WTO agree to avoid trade barriers and restrictions among themselves. Therefore, being WTO member can have various benefits and encourage export performance of the regions.

## **CHAPTER FOUR**

### **Result and Discussion**

This chapter analyses the determinants of export performance in total export, agricultural raw materials, service and manufacture exports in East African countries, using the annual balanced panel data, where all the variables are observed for each cross-section and each time period. The study has a time series segment spanning from the period 2005 up to 2014 and a cross section segment which considered seven East African countries based on the available of data. the organize data were presented and important correlation and regression results were discussed accordingly, first fixed vs. random effect model test was made this help to identify which model is appropriate for the data, next the classical liner regression model/CLRM test or Diagnostic tests were made, correlation analysis between study variables and the descriptive statistics of dependent and independent variables were followed. The results of fixed effect panel data regression model were presented, and finally the most important part; that was detail discussion of results based on the findings and empirical literatures reviewed for the study were made.

#### **4.1. Choosing Fixed versus random effect model**

The determinants of total, agricultural, service and manufacture export are identified and the models are developed based on the economic theory in the methodological part of this study. The organized data were estimated based on the panel model, which includes cross sectional and time series observations for seven countries of the region over the period 2005 to 2014. Fixed effects and random effects models are commonly used models for the panel data. In order to choose fixed or random effect model for all of the models (total, agricultural, services and manufacture export) a formal test so called hausman test was used which was based on the null hypothesis in favor of

random effect model estimator. When the test is made it is important to see the p-value because the decision was made on the basis of this value, accordingly if p value is higher than 0.05 (i.e. it is insignificant) hence random effects is preferable or whereas if p value is lower than 0.05 (i.e. it is significant) fixed effect is preferable (Gujarati 2004).

**Table 1** Tests for choosing fixed versus random effect model.

Test for model one: Ho: RE model is appropriate. H1: FE model is appropriate.					
	Test summary	Chi-sq statistic( $\chi^2$ )	Chi-sqdf	Prob.	Appropriate model
Model one (total EX)	Cross-section random	52.76	6	0.0000(*)	Fixed Model is appropriate
Model two (Agriculture EX)	Cross-section random	25.28	6	0.0003(*)	Fixed Model is appropriate
Model three (service EX)	Cross-section random	9.68	6	0.1389(**)	Random Model is appropriate
Model four (Manufacture EX)	Cross-section random	9.09	6	0.1687(**)	Random Model is appropriate

*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

*The \* indicate that reject the null hypothesis of random effects model is appropriate than the fixed effects model at 1% significant level. And \*\* indicate that random effect model is appropriate for model three and four since the p value is greater than 5% level of significant.*

One can conclude that the  $p$ -value for the test from the above table is less than 5%, indicating that the random effects model is not appropriate and that the fixed effects specification is to be preferred or when the  $p$ -value is greater than 5% , then fixed effect is not appropriate and random effect is appropriate. So, the cross-section fixed effects model is the appropriate for the first two models and random effect is appropriate for the next two models.

## **4.2. 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 implements 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. Options allow you to include fixed effects and time trends in the model of the data-generating process.

The assorted tests make different asymptotic assumptions regarding the number of panels in your dataset and the number of time periods in each panel. The majority of the tests assume that you have a balanced panel dataset, but the Im–Pesaran–Shin and Fisher-type tests allow for unbalanced panels. In this study we use the summary for all variables using Eviews and the results for all variables are established in the following table 2.

**Table 2: 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 Statistic	p-values	Test for unit root in level
LnEX	-2.22632	0.0130	I(0)
LnAGEX	-3.16212	0.0008	I(0)
LnSEX	-3.91550	0.0000	I(0)
LnMEX	-6.10896	0.0000	I(0)
LnFDI	-4.91468	0.0000	I(0)
LnREER	-2.09558	0.018	I(0)
LnDOP	-12.7147	0.0000	I(1)
GDPG	-9.43892	0.0000	I(0)
AINITQ	-8.24736	0.0000	I(0)

*Source; from World Bank (2014) andUNCTAD statistics data computed by own using Eviews*

According to the above table result, we reject the null hypothesis and conclude that the variables are almost all are stationary at level except degree of openness. We obtain a test statistic that is significant at the 5% level.

### **4.3. Testing assumptions of classical linear regression model (CLRM)**

After choosing whether fixed or random effect was appropriate for the study, the next step was testing for the assumption of CLRM. This was important to make sure that the data and the model fit with classical linear regression model assumptions. Hence, the assumptions of CLRM was tested to know whether the data and the model for this study was fit or not with the assumption. As per Verbeek (2005), the first assumption required that the average value of the errors is zero ( $E(u_t) = 0$ ). In fact, if a constant term is included in the regression equation, this assumption will never be violated. Therefore, since the constant term (i.e.  $\alpha$ ) was included in the regression equation, the average value of the error term in this study was expected to be zero.

#### **4.3.1. Test for normality assumption**

Checking whether the disturbances are normally distributed or not is one of the assumptions of CLRM; hence the normal distribution is not skewed and is defined to have a coefficient of kurtosis 3. Accordingly one of the most commonly applied tests for normality Using Stata, you can test normality by either graphical or numerical methods. The former include drawing a stem-and-leaf plot, scatterplot, box-plot, histogram, probability-probability (P-P) plot, and quantile-quantile (Q-Q) plot. The latter involve computing the Shapiro-Wilk, Shapiro-Francia, and Skewness/Kurtosis tests. Skewness measures the extent to which a distribution is not symmetric about its mean value and kurtosis measures how fat the tails of the distribution are. If the residuals are normally distributed, the histogram should be bell-shaped and the Shapiro-Wilk, Shapiro-Francia statistic would not be significant. This means that the  $p$ -value given at the bottom of the normality test screen should be bigger than 0.05 not to reject the null of normality at the 5% level (Brooks 2008). (See the results from appendix 7)

According to the above Stata output we can reject the null hypothesis that is the residuals are normally distributed, except on the GDP growth rate (growth annual %). Generally, non-normality is not a too big concern in panel data analysis but it matters for inference. Thus, we can correct for this by using the robust option.

#### **4.3.2. Test for Multicollinearity Assumption**

The multicollinearity test is conducted in this study to identify the correlation between explanatory variables and to avoid double effect of independent variable from the model. The problem of multicollinearity usually arises when certain explanatory variables are highly correlated. The next table, described correlation among explanatory variables. A correlation is a single number that describes the degree of relationship between two variables. In other words, multicollinearity describes the relationship among explanatory variables. As indicated on the correlation matrix almost all correlations that have occurred among explanatory variables are surprisingly weak correlations; this indicates there is no the existence of multicollinearity problem on the study. Even if, relatively high positive correlation existed between human capital resources and average income of the major export (0.7966) the researcher ignored this near multicollinearity problem. Usually, as Cooper and Schindler (2009) and Hailer et al (2006) suggested that multicollinearity problem should be corrected when the correlation extent to be above 0.8 and 0.9 respectively. Noted by Hair et al. (2006) correlation coefficient below 0.9 may not cause serious multicollinearity problem. In contrary to this, Kennedy (2008) argued that as any correlation coefficient above 0.7 could cause a serious multicollinearity problem leading to inefficient estimation and less reliable results.

**Table 3. Multicollinearity test results**

	LNAIMED	LNFDI	LNREER	lnDOP	GDPG	AINITQ	lnHC	LCKD	WTOM
LNAIMED	1.0000								
LNFDI	0.4254	1.0000							
LNREER	0.0647	0.0511	1.0000						
lnDOP	-0.0308	-0.2299	0.5409	1.0000					
GDPG	0.0540	0.2356	0.1176	0.0996	1.0000				
AINITQ	-0.2550	-0.0155	0.1729	0.4786	0.3466	1.0000			
lnHC	-0.3302	-0.0384	0.3319	0.2718	0.4004	0.7966	1.0000		
LCKD	-0.7969	-0.2978	0.0818	-0.0564	0.2884	0.1559	0.4511	1.0000	
WTOM	-0.7969	-0.4596	0.1219	0.5581	-0.2681	0.6772	0.4463	0.0913	1.0000

*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

#### **4.3.3. Test for Heteroscedasticity assumption**

Among those diagnostic test which are conducted in this study is heteroscedastic test. This theoretically expressed as by Brooks (2008,p.133)  $\text{var}(\epsilon_t) = \sigma^2 < \infty$ ; it has been assumed that the variance of the errors is constant, this is known as the assumption of homoscedasticity. If the errors do not have a constant variance, they are said to be heteroscedastic.” White (1980) as cited by (Brooks, 2008 p. 134) is the most popular test of homoscedasticity.

To test the presence of heteroscedasticity for fixed models, it is better to use modified Wald test for group wise the available heteroskedasticity in fixed effect regression models.

**Table 4: Heteroscedasticity test results**

Model	Chi <sup>2</sup> (6)	Prob>Chi <sup>2</sup>
Model lnEX	138.84	0.0000
Model lnAGEX	18.90	0.0085

*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

As If there is heteroskedasticity then using test results, we can see that there is heteroskedasticity problem. The null hypothesis is homoskedasticity (or constant variance of error) and the alternative hypothesis there is heteroskedasticity. This test involves testing the null hypothesis that the variance of the errors is homoscedasticity (constant) which is the desirable one versus the alternative hypothesis the error terms variance are vary as some of the variables are changes (heteroscedasticity). Based on the above hypothesis, now let us see each model separately. For random effect model before testing for heteroskedasticity we have check the existence (severity) of serial correlation problem. If there is serial correlation is detected and significant (p- values of the test less than 0.05) we have to use cluster standard error. If there is serial correlation is not detected it is better to use robust standard error. The above methods will eliminate the problem of heteroskedasticity within the random models. And have the following tables:

**Table 5: Heteroscedasticity test results**

Wooldridge test for autocorrelation in panel data		
H0: no first-order autocorrelation		
Models	F(1,6)	Prob>F
Lnsex	6.332	0.0455*
Lnmx	1.957	0.2113

*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

According to the above stata output for serial correlation test there is serial correlation problem in the first model but not in the second model.

**Table 6: Heteroscedasticity test results**

H0: homoskedasticity (or constant variance of error) against H1: heteroskedasticity		
Models	F(1,6)	Prob> F
Model one: LnEX	11.245	0.0154*
Model two: LnNAGEX	18.927	0.0048*
Model three: lnSEX	Heteroscedasticity test is (using Xttest3 is not displayed ) for both random effect model	
Mode four LnMEX		

*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

From Heteroscedasticity test and serial correlation test results, we can see that there is heteroskedasticity and serial correlation problem. Hence, to remove the presence of heteroskedasticity and serial correlation we use vce(robust) standard error instead of the default stata standard error for the model.

#### 4.3.4. Test for Autocorrelation assumption

The second important diagnostic test which is performed in this research is the autocorrelation test. This assumption of OLS theoretically expressed by the numbers of scholars among that Brooks (2008) and Verbeek (2004) founded. They expressed as;  $cov(u_i, u_j) = 0$ , this is another assumption that is made of the CLRM's disturbance terms is that the covariance between the error terms over time (or cross-sectionally, for that type of data) is zero. In other words, it is assumed that the errors are uncorrelated with one another. If the errors are correlated with one another, it would be stated that they are 'autocorrelated' or that they are 'serially correlated'. The most common test of this assumption is by using the Durbin–Watson test, Pasaran CD test and the Breusch-Godfrey test (Boorks, 2008, p. 144). As far as concerning this paper the researcher used Pasaran CD test

**Table 7: autocorrelation test results**

H0: the residuals are not auto-correlated, against H1: the residuals are auto-correlated			
Model	Pesaran's test of cross sectional independence	Average absolute value of the off-diagonal element	Prob.
Lnagex	-0.695	0.321	0.4871
Lnex	-0.213	0.329	0.3190
Lnsex	1.947	0.362	0.0515
Lnmx	2.556	0.344	0.0607

*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

Pasaran CD (cross-sectional dependence) test is used to test whether there is a cross-sectional dependence between the residuals across entities. Here, the null hypothesis is that the residuals are not auto-correlated which is desirable. As we can see from the above output it's revealed that there is no correlation among residuals for all models.

#### **4.4. Descriptive Statistics of the variables**

This section provides the descriptive statistics of dependent and independent variables which helped to have the overall look at variables being studied. It indicated the result of all variables Page 47calculated as mean, median, standard deviation, minimum and maximum values with the number of observations under the study were demonstrated in tabular form. Hence, table 8 below presented the descriptive statistics values of the study variables that were both dependent and independent variables for the study period and all variables comprised 70 observations. The study used the dependent variable which measures the total export, agricultural, service and manufacture export and seven independent variables. Mean value shows the average value of all sampled countries in each variable; whereas the minimum and maximum values of each variable from all sampled countries were shown in the minimum and maximum statistics respectively. Sample variation from the mean was shown in the standard deviation statistics which is the square root of variance and normally good if it is low.

**Table 8: Summary statistics for all dependent and independent variables**

Dependent variables	Obser.	Mean	Median	Maximum	Minimum	Std. Dev.
EX	70	16.08253	17.00757	28.50903	6.132845	5.042137
AGEX	70	7.431097	6.43438	20.41326	0.387302	4.730464
MEX	70	16.51027	13.89392	37.2729	0.027508	12.32785
SEX	70	1480000000	1200000000	4970000000	30795299	1330000000
Independent variables						
GDPG	70	6.54199	6.41569	12.55054	-2.214703	3.109207
REER	70	115.7041	107.3434	207.2164	47.91583	31.02895
FDI	70	6.88E+08	3.91E+08	2.31E+09	31593.78	6.97E+08
HC	70	3.728571	4	4.5	2.5	0.629502
INITQ	70	0.108559	-0.201216	2.255432	-1.400659	1.033138
DO	70	45.07076	45.606	64.47887	19.11879	7.994566
AIMED	70	1925830	2395804	3680088	101443.3	1596336
LCKD	70	0.5714286	1.000000	1.000000	0.000000	0.4984448
WTOM	70	0.7142857	1.000000	1.000000	0.000000	0.4550158

*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

As stated in the above table 8: All variables comprised 70 observations. The mean of the independent variables EX equals 16.08 which show the average export of goods and services as percentage of GDP for the East Africa countries with at 5.04 standard deviations. The minimum

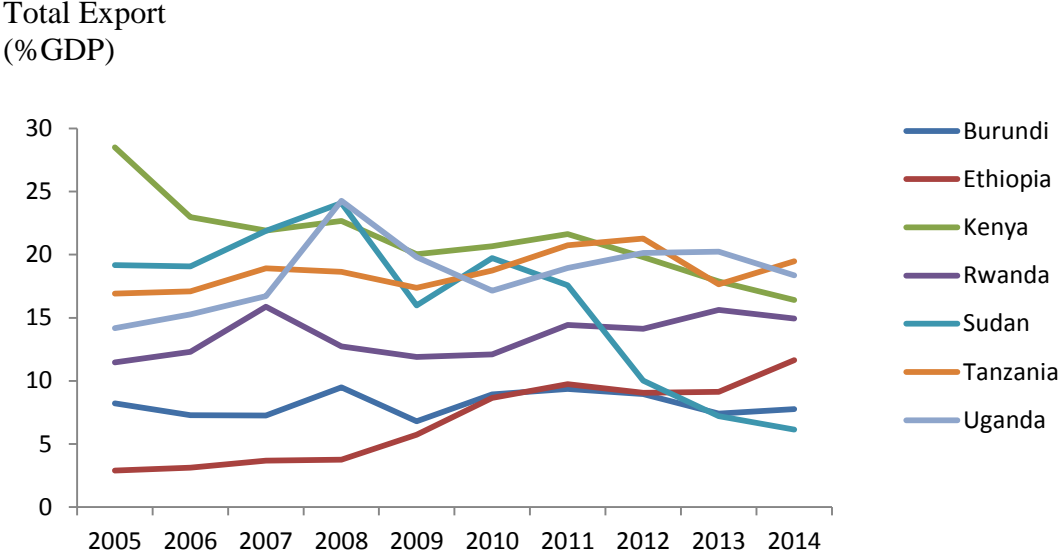
and the maximum value of the export performance the region will be 28.50 and 6.13 respectively. The mean of agriculture raw materials and manufacture export as percentage of merchandised equals 7.43 and 16.51 and the standard deviation of these variables are 4.7 and 12.32 respectively. The maximum and minimum values are 20.41, 0.38 and 37.27, 0.02 respectively. The mean of service sector export in EA countries equals 1.48E+09 with the standard deviation of 1.33E+09. The maximum and minimum values are 4.97E+09 and 0.3E+07. The remaining independent variables were macroeconomic indicators (i.e. GDP growth rate, real effective exchange rate, foreign direct investment net inflow, human capital proxy by building human resources assesses the national policies and public and private sector service delivery that affect the access to quality of health, education services, and including prevention and treatment of HIV/AIDS, tuberculosis, and malaria, institutional quality proxy by government effectiveness indicators, trade as a percentage of GDP and average income of major export destination of each country during 2014 which could affected total export, agricultural, manufacture and service export of the regions over time and these variables were the same for all sampled countries at a given period.

Continuing to the explanatory variables of the model, there are some interesting statistics to mention. The mean value of the GDP growth rate is 6.54 with at 3.10, standard deviation. The maximum and minimum value of this variable is 12.55 and -2.21 respectively. This shows that there is a negative GDP growth rate among the East African countries.

The two variables that are employed in this study which shows about the peoples and institutions in the regions are human capital and institutional quality. The mean of human capital 3.72 we can say that the human resources rating indicates that it is better off, but we can conclude that there is still problem on the quality of health, education services, including prevention and

treatment of HIV/AIDS, tuberculosis, and malaria in the region since the minimum value is 2.5 which very small relative to the higher indices of the human resource rating (higher = 6) and it variance from the mean by 0.63. The institutional quality (the average values of all the indicators) mean is 0.11 with standard deviation 1.03. Therefore, the institutional quality here in east African country are still big problem as its median, minimum and maximum indicates almost majority of the country in this region is negative. The other macro variables are trade openness and major export distention average income of the region. Trade openness basic issue is no what does a country export or import but how much does a country export and import in relation to its GDP. Based on this theoretical frame the mean of the degree of openness is 47.07 percent with the standard deviation of 7.99 percent. The maximum and minimum values of DOP are 64.48 and 19.12 percent respectively.

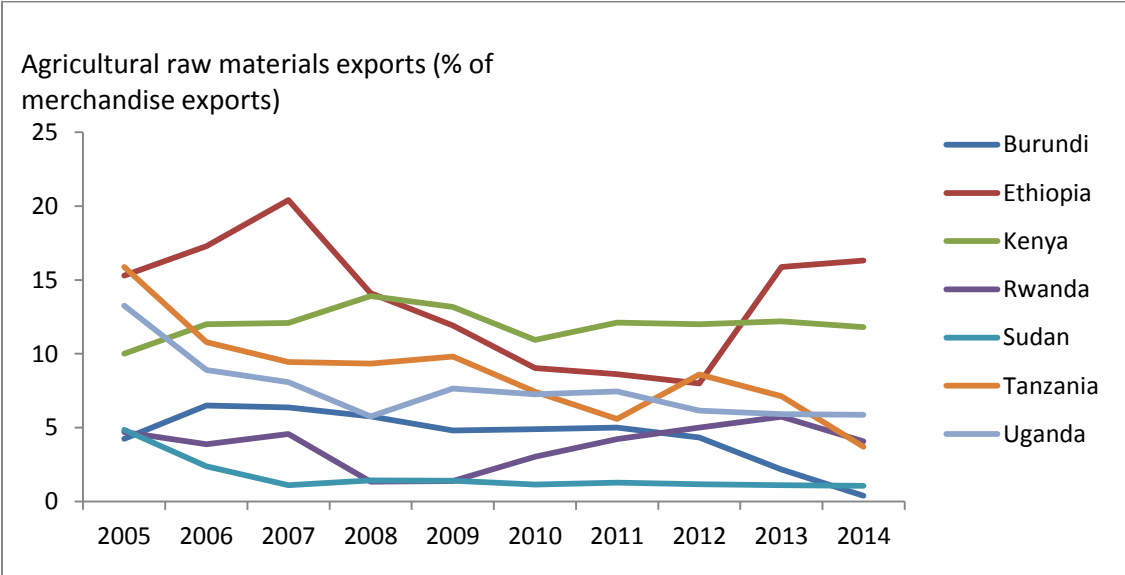
Figure 1: Total export (% GDP) trend in EA, 2005-2014



Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result

Songwe et.al (2012) shows the trends of world export of goods by six world regions including SSA over the periods 2007 – 2010. And SSA countries are export trend is decline special at the time world economic crisis and it is below the other regions. As we see from figure 1 the total export performance in this region is stagnant over the period 2005 -2014. But there was some fluctuate during the time of the world economic crisis. When we observe the trend by country Ethiopian, Uganda, Rwanda export performance over the last period were below all east African country, but they become better off to Sudan near to 2014.

Figure 2: Agricultural raw materials exports (% of merchandise exports) trend in EA, 2005-2014



Source; from World Bank (2014) andUNCTAD statistics data computed by own using Stata result

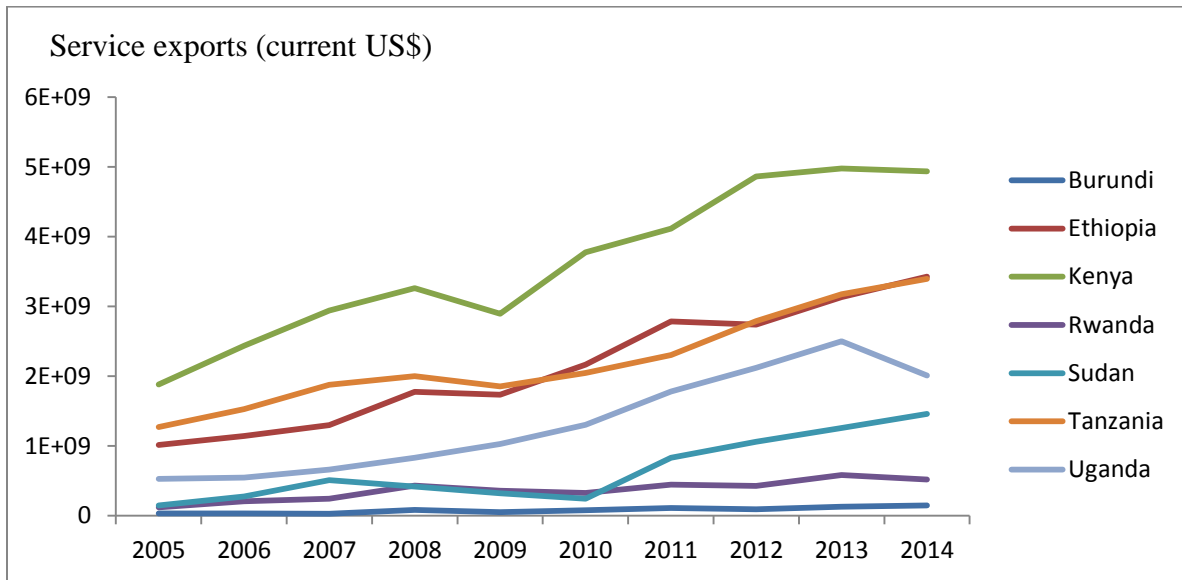
As shown in the above figure 2 the over view of the agricultural raw materials<sup>1</sup> export performance trends in East African countries fluctuate over the period 2005-2014. From this we can understand that the trends of agricultural raw materials export are difficult to forecast in this region. When we observe the trends separately for each country we can see that country like

Ethiopia, Kenya and by some amount Burundi trends early periods in this study their export were increase up to the world economic crisis, but countries like Tanzania, Sudan and Uganda’s agricultural raw materials export start at decreasing rate. Based on the above figure 2 we can say that Kenya and Ethiopia agricultural raw materials export performances improved over the period relative to the other countries.

*Sebastián Sáez et al.* (2011) shows Service Exports trends by Comparison across Income Groups (i.e. High income, low income, lower middle income, and middle income world) over the period 2000–08.

Since, almost all East Africa countries are low income country and we can see that their service exports are increasing over the periods according to *Sebastián Sáez et al.*

**Figure 3: Service exports (current US\$) trend in EA, 2005-2014.**

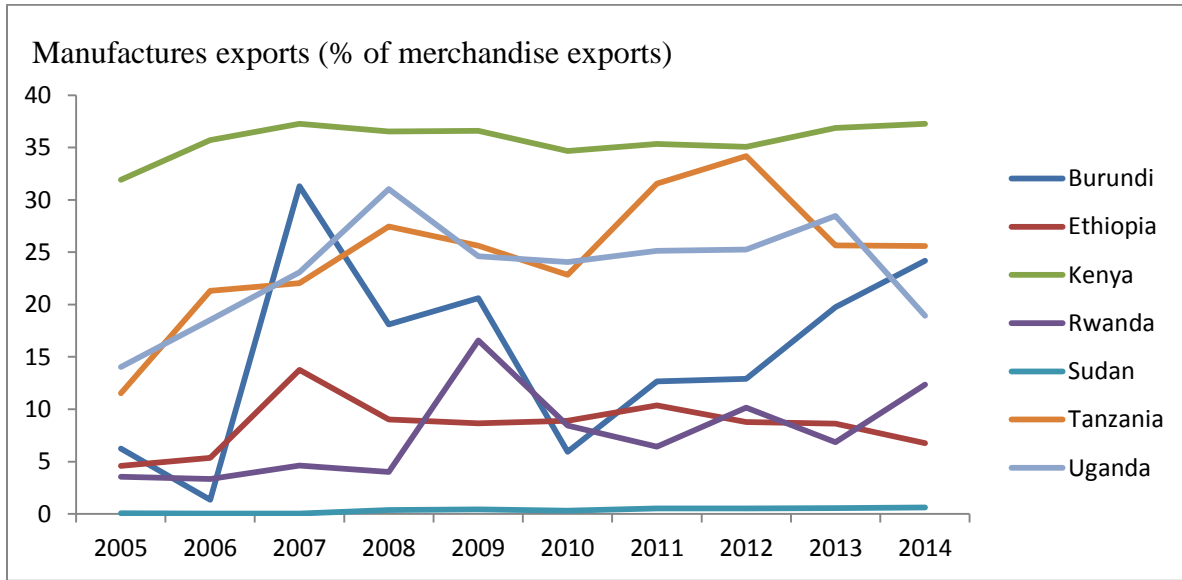


*Source; from World Bank (2014) and UNCTAD statistics data computed by own using Stata result*

As we have observed from the above figure-3 despite the services sector is not as old as other sector export performance special in the region increase over the time except Burundi and Rwanda and special Burundi’s service sector export performance is stagnate over the periods.

Country like Kenya, Tanzania and Ethiopia service sector export performance are upright relative to the other country in the region.

**Figure 4: Manufactures exports (% of merchandise exports) trend in EA, 2005-2014.**



*Source; from World Bank (2014) andUNCTAD statistics data computed by own using Stata result*

In the last, in this descriptive part of the study we want to see manufacture export trends. And as we observed from the above figure the manufacturing export in this region is highly fluctuate over the time except Kenya which stable and higher than the other country within the region over the periods. When we see the manufacture sector export performance in Sudan over the above series almost it is closed to zero. And Ethiopia and Rwanda manufacture export performance are below from other country except Sudan.

Generally, when we observe all figures in the above we can conclude that export performance of the region is still poor and stagnant. But country like Kenya show better export performance relative to other countries in all sectors. And we can see that the service sector in this region is booming over the periods in majority of the countries.

#### 4.5. Discussion on the Regression Results

In this study we analysis both demand and supply side determinants of the total export, agricultural raw materials, service and manufacture export estimation are conducted using the fixed and random effect models. As justified in the previous topics the estimation technique which results in consistent and unbiased estimates is selected. Thus, the fixed effects estimation techniques is appropriate for total and agricultural raw materials export models whereas random effect estimation technique is preferred for service and manufacture export and yield efficient and consistent results. The regression results have their own implications, and hence the coefficient indicates each variable's level of influence on the dependent variable which may has a coefficient of negative or positive. P-value indicates at what percentage or precession level of each variable is significant.

##### 4.5.1. Estimation result for total export performance

In order to see the implication of both demand and supply factors on the total export performance conducted using the fixed effect model. As table 9 and appendix 9 shows a number of variables are found to be statistically significant with their estimated signs. As per the Stata result the most important determinants of total export in East Africa countries are degree of openness, foreign direct investment net inflow, human capital and average institutional quality. However, real effective exchange rate and GDP growth rate are relatively small. The estimated equation of the real value of export of total export as a percentage of GDP can be written as:

$$\ln EX_{it} = 0.4685 \ln FDI_{it} - 0.1209 \ln REER_{it} + 1.4041 \ln DOP_{it} - 0.0036 \ln GDP_{it} - 0.3934 \ln ITQ_{it} - 0.4189 \ln HC_{it} \dots \dots \dots (4.1)$$

As equation 4.1 shows, the results are to some extant in line with the theory. For instance an increase foreign direct investment net inflow and degree of openness leads to increasing in the total export performance in east African countries. And real effective exchange rate is the demand

side factor which affects the total export performance negatively. GDP growth rate and average institutional qualities are the supply side variables which affect the total export negatively. Eatzaz Ahmad et.al (2007) real exchange rate is insignificant with positive sign, but (M.A. Babatunde, 2009) find similar results in SSA countries insignificant and negative relationship. The result also shows that foreign direct investment net and degree of openness in total export performance is statistically significant. And average institutional quality is statistically significant, but has negative relation. Intuitively average institutional quality is expected to have positive impact on total export but it contrary with theory. It may be due to the nature of the institution in East Africa and those measurements may not give emphasis on the export performance of the region. F value of 0.000 indicates strong statistical significance, which enhanced the reliability and validity of the model. See from appendix 9 about estimation results.

#### **4.5.2. Estimation result for Agricultural raw materials export performance**

Based on the result of the fixed effect model, the determinants of agriculture raw materials export in East Africa are foreign direct investment net inflow (affect negatively), real effective exchange rates (affect positively), degree of openness (affect positively), GDP growth rate (affect positively), average institutional quality (affect positively) and human capital (affect negatively).

However, except foreign direct investment net inflow all are statistically insignificant. Which is contracted with E. Tesfaye (2014) and B. Melcaw (2010) the sign of the coefficient of FDI is positive but statistically insignificant in agricultural raw materials export performance in SSA countries. But this study tries to consider the impact of net inflow and according to table 9 and appendix 10 implies that FDI net inflow has negative impact for the encouragement in the activity of the agriculture raw material export in East African countries of the agriculture raw material

And which is challenge the theoretical point of view over the expectation on agriculture raw materials export. This may be due to some special feature of the region (such as agriculture sector products are not more than consumption at domestically level). Almost all east African country agriculture is rain based, mostly the agriculture raw materials export goods are not diversified enough in this region, and we can say that those predictors have not potential variables to explain agricultural raw materials in the context of east African. For all aspect of the result refer equation 4.2 and appendix 10.

$$\ln AGEX_{it} = -0.1719 \ln FDI_{it} + 0.0660 \ln REER_{it} + 0.1726 \ln DOP_{it} + 0.0039 GDPG_{it} + 0.6998 AINITQ_{it} - 1.1594 \ln HC_{it} \dots \dots \dots (4.2)$$

Overall test of significant F statistics shows that the model was good enough fitted and statistically significant at 1% level (i.e. p-value = 0.000). Which enhanced the coefficient of all variables are none zero. See from appendix 10 the whole stata output of agricultural raw materials export estimation results.

**Table 9: Parameter Estimates of Fixed Effects Models (for total and Agricultural export)**

Variables	Total Export Equation	AGEX Export Equation
LnFDI	0.0468(0.0208*)	-0.1719(0.0729*)
LnREER	-0.1209(0.0922)	0.0660(0.3238)
LnDOP	1.4041(0.1561*)	0.1725(0.5478)
GDPG	-0.0036(0.0078)	0.0039(0.0274)
AINITQ	-0.3934(0.1684)	0.6998(0.5909)
LnHC	-0.4189(0.2510**)	-1.1594(0.8809)
Pro > F	0.0000	0.0282

*Note: The numbers in parentheses are the Std.err. The statistics significant at 5 percent and 10 percent levels are indicated by \* and \*\* respectively. Pro > F indicate the all over significant of the Models.*

#### 4.5.3. Estimation result for service export

Based on the hausman test random effect is appropriate model for service sector export performance of the region. Since random effect model is appropriate in order to see the impact of those variables which do not vary over the time (like dummy), in addition to macro variables (which are not vary over the time). The effect of average income of major export destinations of the countries, foreign direct investment net inflow and human capital are statistically significant and positive signs in explain the service sector export performance in the region. Thus, as people have accessed to quality of health and education services, including prevention and treatment of HIV/AIDS, tuberculosis, and malaria. Therefore, it is key channel for the growth of service export. GDP growth rate is significant and negative signs in explain service export. The effect of real exchange rate on service export is insignificant with negative sign, indicates opposite relationship. Thus the real depreciation of domestic currency reduce the for service sector export

promotion. To check whether, all the coefficients of the predictors are different from zero, in this model we have to see the Probability value from table 10 and appendix 11. If it is less than 0.05, then your model fitted. Thus, we can reject the null hypothesis that the coefficients are zero. See the whole service export estimation model from appendix 11.

$$\begin{aligned} \ln \text{SEX}_{it} = & 1.1050 \ln \text{AMEXDI}_{it} + 0.3288 \ln \text{FDI}_{it} - 0.1861 \ln \text{REER}_{it} + 0.1417 \ln \text{DOP}_{it} \\ & - 0.0716 \text{GDPG}_{it} + 0.1024 \ln \text{AINITQ}_{it} + 2.0672 \ln \text{HC}_{it} + 1.6972 \text{LDLK}_{it} \\ & + 1.6225 \text{WTOM}_{it} \dots \dots \dots (4.3) \end{aligned}$$

**4.5.4. Estimation result for Manufacture export**

The effect of average income of major export destinations of the countries (which is the supply side factor) is found to be the most important determinants of the manufacture export in east African countries. And According to table 10 and the appendix 12 average income of major export affect this sector positively and statistically significant. Human capital (which is the demand side factor) affects the manufacture export performance positively and insignificant. It may be due to that people in east African may not be assign the right person at the right place. Means persons who are qualified in the manufacture sector may displace in other sectors. But theoretical as people have accessed to quality of health and education services, including prevention and treatment of HIV/AIDS, tuberculosis, and malaria, the manufacture export in the region become upsurge. Another macro variable which affects the manufacture export positively in this region is foreign direct investment net inflow which is also statistical significant. Which indicate that, as FDI net inflow increase to the host countries can use the resources such as labor and others effectively. This is because; there is technology share duet to FDI from the rest of the world. In appendix 12 we can observe the all over estimated results.

$$\begin{aligned} \ln \text{SEX}_{it} = & 1.8673 \ln \text{AMEXDI}_{it} + 0.1254 \ln \text{FDI}_{it} - 0.5156 \ln \text{REER}_{it} - 0.3556 \ln \text{DOP}_{it} \\ & - 0.1294 \text{GDPG}_{it} - 0.3103 \ln \text{AINITQ}_{it} + 1.0249 \ln \text{HC}_{it} + 5.1404 \text{LDLK}_{it} \\ & + 5.4400 \text{WTOM}_{it} \dots \dots \dots (4.4) \end{aligned}$$

Based on the above estimation results discussion we can head to the conclusion and policy recommendation.

**Table 10: Parameter Estimates of Random Effect Models (service and manufacture)**

Variables	Service Export Equation	Manufacture Export Equation
Lnaimed	1.1050(0.1129*)	1.8672(0.1461*)
Lnfdi	0.3287(0.0306*)	0.1253(0.0396*)
Lnreer	-0.1861(0.2857)	-0.5055(0.3695)
Lndop	0.1417(0.4754)	-0.3656(0.6150)
Gdp	-0.0716(0.0243*)	-0.1294(0.0315*)
Ainitq	0.1023(0.3204)	-0.3103(0.4151)
Lnhc	2.0672(0.7020*)	1.0249(0.9081)
Lckd	1.6972(0.3457)	5.1404(0.4472*)
Wtom	1.6125(0.3926*)	4.4400(0.5079*)
Pro > chi <sup>2</sup>	0.0000	0.0000

*Note: The numbers in parentheses are the Std.err and \* indicate 5 percent statistical significant. And Pro > chi<sup>2</sup> indicate the all over significant of the Models.*

## CHAPTER FIVE

### 5. CONCLUSION AND RECOMMENDATION

The preceding chapter presented the results and discussion, while this chapter deals with the conclusions and recommendations based on the findings of the study. Accordingly this chapter is organized into two sub-sections. Section 5.1 presents the conclusions and section 5.2 presents the recommendations.

#### 5.1. CONCLUSION

The central question investigated in this paper is whether the supply side or the external/demand side factors significantly determine the total export, agricultural raw material, service and manufacture export performance of EA countries. To address this question we use the panel data for descriptive and empirical analysis which consisting of seven EA countries over the period 2005-2014. The study uses secondary data collected mainly from WDI (2014) and UNCTAD (2014) for all models explanatory variables are similar but because of the nature of the variables some of them do not specified in log form. In this study average income of major export destinations of the country, real effective exchange rate of, WTO Dummy (1 if member 0 if not) are the demand side determinants of export for all models of export. GDP growth rate (growth annual %), average institutional quality, Institutional quality, foreign direct investment net inflow, human capital and trade openness are included as the supply side factors of export in this region. The study also used huasman test to select fixed and random effect model for the estimation of variables coefficient under the models. And for total and agricultural raw material export model fixed effect is appropriate whereas random effect is appropriate for service and manufacture export performance in the region.

After specified the export function for total agricultural raw materials, service and manufacture export the variables are checked for unit root. Most of the variables, except trade openness (i.e. stationary at first difference) all variables are stationary at level (i.e. the result of the majority of the tests revealed that the null hypothesis of a unit root is rejected at level).

The estimated result using fixed effect model show that, total export(%GDP) is found to be positive relationship with foreign direct investment net inflow and trade openness and statistically significant. But real exchange rate, GDP growth rate, average institutional quality and human capital have negative relationship and except average institutional quality all variables are insignificant. From this we can say that total export highly constraint by supply side and demand side determinants.

According to the estimated model the determinants of export of agricultural raw material from EA countries do not show the expected result in line with the theoretical perspective. Despite trade openness, real exchange rate, GDP growth rate and average institutional quality have positive impact, statistically insignificant. Foreign direct investment net inflow and human capital have negative relationship, but FDI net inflow is significant. Thus, we can conclude that agricultural raw material export in this region is not influenced by those demand and supply side variables.

The export of service from EA mainly depends on the human capital, average income of major export destination and foreign direct investment net inflow. These variables were found to be statistically significant. GDP growth rate affect the export of service negatively which mean the growth rate has no contribution for this sector. This result is not expected, but it may be due to crowding out effect because of the absences of variables which may determine the service sector

export performance of the region and also there may a ways that countries in this region used GDP growth rate for other purposes.

Final, the export of manufacture export from EA countries highly depend on average income of major export destination and human capital which are disturbs positively and significant. Thus the manufacture export in this region will have some sort of impact in the as the income of the importer increase and when the people of the region have accessed to quality of health and education services, including prevention and treatment of HIV/AIDS, tuberculosis, and malaria. Similarly to service sector export the GDP growth rate have negative impact on manufacture exports. And since random effect model is appropriate for both service and manufacture sector export, we can observe the impact of dummy variable. Thus, they have positive impact and significant.

## **5.2. RECOMMENDATIONS**

The finding indicates that policy makers almost should give equal emphasis for demand and supply side determinants of export performance as long as the foreign market access condition indirectly affects the export potential utilization of EA countries.

FDI is an easy means of transfer of technology. Also, FDI, serving as an instrument of economic growth, promotes domestic investment, and improves human capital and institutions in the host countries. Thus, governments in East African countries are increasingly looking for best-practice policies towards inward Foreign Direct Investment (FDI). FDI can bring positive effects (market access, technology, finance, skills). But the positive effects are not automatic for host countries and depend on policies in place and other factors. Therefore, EA countries should continue to follow FDI favorable policies as this could help them expand all sectors export performance.

As trade openness has positive impact on the total export sector. Thus, EA countries should elimination of export and import duties since it has significantly affected growth of exports and imports in the region.

In developing countries, especially the poorest ones, like EA countries governments face a number of challenges to make the most of available man power. These challenges are profound and complex. Therefore, Policy makers should acknowledge the critical role of a strong human resource base in complementing other investments and policies to improvement all over economy of the region. This can be via investing on education and health related area. These could help for the export performance in service and manufacture sectors.

WTO membership contributes significantly for the export performance. Therefore, countries which are non-members from EA countries should give emphasis in the accession to WTO.

Thus, the success of the EA countries in exploiting the possibilities available in developed country markets has been determined to a great extent by the policies applied by the countries themselves.

This study examined only specific determinants of total agricultural raw material, service and manufacture export performance because of resource and time limitation. Thus, future researcher may address these deficits. Therefore, the future researcher shall conduct research on the issue by including the impact of climate related variables (like rain fall and temperature) especially on agricultural raw materials export performance plus food and mining export should include.

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## **Appendix 1: Countries in the sample**

- 1. Burundi**
- 2. Ethiopia**
- 3. Kenya**
- 4. Rwanda**
- 5. Sudan**
- 6. Tanzania**
- 7. Uganda**

## Appendix 2: Tests for choosing fixed versus random effect for total export model

```
. hausman fixed .
```

	— Coefficients —			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
lnfdi	.0468497	.0810618	-.034212	.0165003
lnreer	-.1208906	-.1703652	.0494746	.
ln dop	1.404125	1.291237	.1128882	.
gdpg	-.0036037	.0067904	-.0103941	.
ainitq	-.3934697	.2129939	-.6064636	.1043186
lnhc	-.4189058	-.201343	-.2175627	.

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          = 52.76
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)
```

### Appendix 3: Tests for choosing fixed versus random effect for agricultural raw material export model

. hausman fixed .

	— Coefficients —			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
lnfdi	-.1719144	.0042897	-.1762041	.0629126
lnreer	.066005	.019173	.046832	.
ln dop	.1725822	.4873732	-.314791	.
gdpg	.0039583	.007207	-.0032486	.
ainitq	.6998217	.5104906	.1893311	.447605
lnhc	-1.159467	-1.127761	-.0317064	.2517147

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)'[(V\_b-V\_B)^(-1)](b-B)  
 = 25.28  
 Prob>chi2 = 0.0003  
 (V\_b-V\_B is not positive definite)

## Appendix 4: Tests for choosing fixed versus random effect for service export model

. hausman fixed .

	Coefficients			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
lnfdi	.1908329	.3287959	-.1379631	.0557271
lnreer	-.1245727	-.1861751	.0616024	.
ln dop	-.1094279	.1417956	-.2512235	.0477912
gdpg	-.0722314	-.0716357	-.0005957	.
ainitq	.3999697	.102394	.2975757	.4034218
lnhc	2.272856	2.067213	.2056435	.3123881

b = consistent under Ho and Ha; obtained from xtreg

B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(6) = (b-B)' [(V\_b-V\_B)^(-1)] (b-B)  
 = 9.68  
 Prob>chi2 = 0.1389  
 (V\_b-V\_B is not positive definite)

## Appendix 5: Tests for choosing fixed versus random effect for service export model

```
. hausman fixed .
```

	— Coefficients —			
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
lnfdi	.2665561	.1253713	.1411848	.0723917
lnreer	-.7631489	-.5155808	-.2475681	.
ln dop	-.4242967	-.3556099	-.0686868	.0793988
gdpg	-.1176057	-.1294601	.0118544	.
ainitq	.038111	-.3103235	.3484345	.5246177
lnhc	.270268	1.024947	-.7546786	.4119641

b = consistent under Ho and Ha; obtained from xtreg  
 B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

```
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
          =          9.09
Prob>chi2 =          0.1687
(V_b-V_B is not positive definite)
```

## Appendix 6: Unit root test

Panel unit root test: Summary

Series: LNEMEX

Date: 05/27/16 Time: 14:05

Sample: 2005 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-6.10896	0.0000	7	61
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-3.42645	0.0003	7	61
ADF - Fisher Chi-square	38.1867	0.0005	7	61
PP - Fisher Chi-square	52.1869	0.0000	7	63

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary

Series: LNFDI

Date: 05/27/16 Time: 14:08

Sample: 2005 2014

Exogenous variables: Individual effects

Automatic selection of maximum lags

Automatic lag length selection based on SIC: 0 to 1

Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-4.91468	0.0000	7	62
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-1.29778	0.0972	7	62
ADF - Fisher Chi-square	21.3618	0.0927	7	62
PP - Fisher Chi-square	27.1537	0.0184	7	63

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary  
 Series: LNREER  
 Date: 05/27/16 Time: 14:10  
 Sample: 2005 2014  
 Exogenous variables: Individual effects  
 Automatic selection of maximum lags  
 Automatic lag length selection based on SIC: 0 to 1  
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-2.09558	0.0181	7	62
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	0.55419	0.7103	7	62
ADF - Fisher Chi-square	10.2365	0.7447	7	62
PP - Fisher Chi-square	5.59945	0.9756	7	63

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary  
 Series: D(LNDOP)  
 Date: 05/27/16 Time: 14:12  
 Sample: 2005 2014  
 Exogenous variables: Individual effects  
 Automatic selection of maximum lags  
 Automatic lag length selection based on SIC: 0 to 1  
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
<u>Null: Unit root (assumes common unit root process)</u>				
Levin, Lin & Chu t*	-12.7147	0.0000	7	52
<u>Null: Unit root (assumes individual unit root process)</u>				
Im, Pesaran and Shin W-stat	-6.97451	0.0000	7	52
ADF - Fisher Chi-square	66.1679	0.0000	7	52
PP - Fisher Chi-square	59.9475	0.0000	7	56

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary  
 Series: D(GDPG)  
 Date: 05/27/16 Time: 14:14  
 Sample: 2005 2014  
 Exogenous variables: Individual effects  
 Automatic selection of maximum lags  
 Automatic lag length selection based on SIC: 0 to 1  
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-9.43892	0.0000	7	52
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-5.85209	0.0000	7	52
ADF - Fisher Chi-square	61.1324	0.0000	7	52
PP - Fisher Chi-square	115.404	0.0000	7	56

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

Panel unit root test: Summary  
 Series: D(AINITQ)  
 Date: 05/27/16 Time: 14:16  
 Sample: 2005 2014  
 Exogenous variables: Individual effects  
 Automatic selection of maximum lags  
 Automatic lag length selection based on SIC: 0 to 1  
 Newey-West automatic bandwidth selection and Bartlett kernel

Method	Statistic	Prob.**	Cross-sections	Obs
Null: Unit root (assumes common unit root process)				
Levin, Lin & Chu t*	-8.24736	0.0000	7	53
Null: Unit root (assumes individual unit root process)				
Im, Pesaran and Shin W-stat	-4.73649	0.0000	7	53
ADF - Fisher Chi-square	51.5058	0.0000	7	53
PP - Fisher Chi-square	81.0218	0.0000	7	56

\*\* Probabilities for Fisher tests are computed using an asymptotic Chi-square distribution. All other tests assume asymptotic normality.

## Appendix 7: Normality test results

```
. sfrancia lnex lnagex lnsex lnmex lnaimed lnfdi lnreer lndop gdpq ainitq lnhc
```

Shapiro-Francia W' test for normal data

Variable	Obs	W'	V'	z	Prob>z
lnex	70	0.89468	7.169	3.804	0.00007
lnagex	70	0.91364	5.878	3.421	0.00031
lnsex	70	0.93071	4.716	2.995	0.00137
lnmex	70	0.78424	14.685	5.189	0.00001
lnaimed	70	0.79173	14.175	5.121	0.00001
lnfdi	70	0.84976	10.225	4.490	0.00001
lnreer	70	0.90570	6.418	3.591	0.00016
lndop	70	0.86477	9.204	4.287	0.00001
gdpq	70	0.98296	1.160	0.286	0.38741
ainitq	70	0.95357	3.160	2.222	0.01314
lnhc	70	0.92206	5.305	3.223	0.00063

## Appendix8: Summery statistics

. xtsum ex agex sex mex aimed reer do gdpq initq hc lckd wtom

Variable		Mean	Std. Dev.	Min	Max	Observations
ex	overall	14.70873	6.015785	2.881209	28.50903	N = 70
	between		5.523119	6.734316	21.25103	n = 7
	within		3.108652	4.754557	22.71725	T = 10
agex	overall	7.431097	4.730464	.3873015	20.41326	N = 70
	between		4.420202	1.685347	13.6856	n = 7
	within		2.321111	1.738472	14.53483	T = 10
sex	overall	1.48e+09	1.33e+09	3.08e+07	4.97e+09	N = 70
	between		1.25e+09	7.94e+07	3.61e+09	n = 7
	within		6.46e+08	-2.42e+08	2.85e+09	T = 10
mex	overall	16.51027	12.32785	.0275081	37.2729	N = 70
	between		12.17878	.3428964	35.71894	n = 7
	within		4.7958	2.547145	32.52091	T = 10
aimed	overall	1925830	1596336	101443.3	3680088	N = 70
	between		1711880	101443.3	3680088	n = 7
	within		0	1925830	1925830	T = 10
reer	overall	115.7041	31.02895	47.91583	207.2164	N = 70
	between		20.04902	94.70191	151.5182	n = 7
	within		24.76414	64.18555	175.3486	T = 10
do	overall	45.07076	7.994566	19.11879	64.47887	N = 70
	between		6.475401	35.57247	55.35042	n = 7
	within		5.239419	28.61708	57.07831	T = 10
gdpq	overall	6.601739	2.956901	2.86e-08	12.55054	N = 70
	between		2.184314	4.08389	10.69388	n = 7
	within		2.143448	1.548702	13.12474	T = 10
initq	overall	.1081429	1.032705	-1.4	2.26	N = 70
	between		.3383659	-.35	.468	n = 7
	within		.9833216	-1.759857	1.900143	T = 10
hc	overall	3.728571	.6295024	2.5	4.5	N = 70
	between		.6088631	2.55	4.45	n = 7
	within		.2718695	3.128571	4.328571	T = 10
lckd	overall	.5714286	.4984448	0	1	N = 70
	between		.5345225	0	1	n = 7
	within		0	.5714286	.5714286	T = 10
wtom	overall	.7142857	.4550158	0	1	N = 70
	between		.48795	0	1	n = 7
	within		0	.7142857	.7142857	T = 10

## Appendix 9: Estimation result for total export

```
. xtreg lnex lnaimed lnfdi lnreer lndop gdpq ainitq lnhc lckd wtom, fe
note: lnaimed omitted because of collinearity
note: lckd omitted because of collinearity
note: wtom omitted because of collinearity
```

```
Fixed-effects (within) regression      Number of obs   =      70
Group variable: countrycode           Number of groups =       7

R-sq:  within = 0.7202                  Obs per group:  min =      10
      between = 0.0803                    avg           =     10.0
      overall = 0.2597                    max           =      10

corr(u_i, Xb) = -0.2655                  F(6,57)         =     24.45
                                          Prob > F        =     0.0000
```

lnex	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnaimed	0	(omitted)				
lnfdi	.0468497	.0207793	2.25	0.028	.0052398	.0884596
lnreer	-.1208906	.0922845	-1.31	0.195	-.3056871	.0639059
lndop	1.404125	.1561202	8.99	0.000	1.0915	1.716751
gdpq	-.0036037	.0078166	-0.46	0.647	-.0192561	.0120487
ainitq	-.3934697	.1684137	-2.34	0.023	-.7307124	-.056227
lnhc	-.4189058	.2510561	-1.67	0.101	-.921637	.0838254
lckd	0	(omitted)				
wtom	0	(omitted)				
_cons	-2.014674	.6732212	-2.99	0.004	-3.362776	-.6665718
sigma_u	.32519736					
sigma_e	.12512492					
rho	.87104603	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(6, 57) =      12.69          Prob > F = 0.0000
```

## Appendix 10: Estimation result for agricultural raw material export

```
. xtreg lnagex lnaimed lnfdi lnreer lndop gdpg ainitq lnhc lckd wtom, fe
note: lnaimed omitted because of collinearity
note: lckd omitted because of collinearity
note: wtom omitted because of collinearity
```

```
Fixed-effects (within) regression      Number of obs   =      70
Group variable: countrycode           Number of groups =       7

R-sq:  within = 0.2132                 Obs per group:  min =      10
      between = 0.0133                   avg   =     10.0
      overall = 0.0388                   max   =      10

corr(u_i, Xb) = -0.3625                F(6,57)         =       2.57
                                          Prob > F        =     0.0282
```

lnagex	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
lnaimed	0	(omitted)				
lnfdi	-.1719144	.0729165	-2.36	0.022	-.3179272	-.0259016
lnreer	.0666005	.3238343	0.20	0.839	-.5824619	.7144719
lndop	.1725822	.5478392	0.32	0.754	-.924447	1.269611
gdpg	.0039583	.0274291	0.14	0.886	-.0509674	.0588841
ainitq	.6998217	.5909785	1.18	0.241	-.4835923	1.883236
lnhc	-1.159467	.8809777	-1.32	0.193	-2.923595	.6046601
lckd	0	(omitted)				
wtom	0	(omitted)				
_cons	3.659242	2.362392	1.55	0.127	-1.071366	8.38985
sigma_u	.85631408					
sigma_e	.43907421					
rho	.79182108	(fraction of variance due to u_i)				

```
F test that all u_i=0:      F(6, 57) =    17.47          Prob > F = 0.0000
```

## Appendix 11: Estimation result for service export

```
. xtreg lnsex lnaimed lnfdi lnreer lndop gdpq ainitq lnhc lckd wtom, re

Random-effects GLS regression           Number of obs   =       70
Group variable: countrycode           Number of groups =        7

R-sq:  within = 0.4910                 Obs per group:  min =       10
      between = 0.9967                   avg           =      10.0
      overall  = 0.9243                   max           =       10

                                           Wald chi2(9)    =      732.09
corr(u_i, X)  = 0 (assumed)             Prob > chi2     =      0.0000
```

lnsex	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnaimed	1.105063	.1129944	9.78	0.000	.8835981	1.326528
lnfdi	.3287959	.0306545	10.73	0.000	.2687142	.3888776
lnreer	-.1861751	.2857061	-0.65	0.515	-.7461488	.3737987
lndop	.1417956	.4754609	0.30	0.766	-.7900907	1.073682
gdpq	-.0716357	.0243511	-2.94	0.003	-.119363	-.0239084
ainitq	.102394	.3208986	0.32	0.750	-.5265558	.7313437
lnhc	2.067213	.7020773	2.94	0.003	.6911665	3.443259
lckd	1.697218	.3457185	4.91	0.000	1.019623	2.374814
wtom	1.612524	.3926831	4.11	0.000	.8428797	2.382169
_cons	-.141207	1.855236	-0.08	0.939	-3.777404	3.49499
sigma_u	0					
sigma_e	.38298568					
rho	0	(fraction of variance due to u_i)				

## Appendix 12: Estimation result for manufacture export

```
. xtreg lnmxex lnaimed lnfdi lnreer lndop gdpq ainitq lnhc lckd wtom, re
```

```
Random-effects GLS regression           Number of obs   =       70
Group variable: countrycode           Number of groups =        7

R-sq:  within = 0.4004                  Obs per group: min =       10
      between = 0.9963                      avg =       10.0
      overall = 0.9198                      max =       10

                                           Wald chi2(9)    =     688.41
corr(u_i, X) = 0 (assumed)              Prob > chi2     =     0.0000
```

lnmxex	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
lnaimed	1.867285	.1461671	12.78	0.000	1.580803	2.153767
lnfdi	.1253713	.039654	3.16	0.002	.0476509	.2030917
lnreer	-.5155808	.3695831	-1.40	0.163	-1.23995	.2087888
lndop	-.3556099	.6150457	-0.58	0.563	-1.561077	.8498576
gdpq	-.1294601	.0315001	-4.11	0.000	-.191199	-.0677211
ainitq	-.3103235	.4151074	-0.75	0.455	-1.123919	.503272
lnhc	1.024947	.9081916	1.13	0.259	-.7550763	2.80497
lckd	5.140445	.4472137	11.49	0.000	4.263922	6.016968
wtom	5.440077	.5079661	10.71	0.000	4.444482	6.435672
_cons	-27.77082	2.399893	-11.57	0.000	-32.47452	-23.06712
sigma_u	0					
sigma_e	.49702839					
rho	0	(fraction of variance due to u_i)				

# Declaration

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

## **Declared by:**

Name: Denekew Aman

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

Date: June17, 2016

## **Confirmed by Advisor:**

Name: Girma Estiphanos(PhD)

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

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