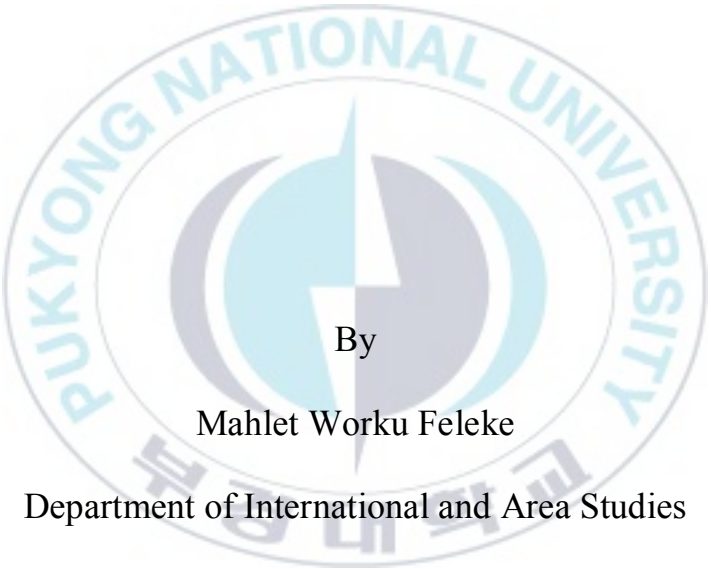
Thesis for the Degree of Master of Arts

Export Competition between Ethiopia and Kenya in the European Union



By

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Department of International and Area Studies

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Pukyong National University

February, 2018

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유럽연합에서 에티오피아와 케냐의 수출 경쟁

Advisor: Prof. Utai Uprasen

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Mahlet Worku Feleke

A thesis submitted in partial fulfillment of the requirements

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Abstract

The relative competitiveness of exports plays an important role in determining the level of exports. It is especially important for developing and under developed nations, to boost their foreign exchange reserves, reduce their balance of payments deficit, and provide employment which would result in improved standards of living for all of the society. Unfortunately, due to regional and economic differences between nations, international competition still faces so many challenges. These challenges are more difficult in developing countries such as Ethiopia and Kenya, since their economy is based on only a few undiversified (agricultural) primary commodities. This study examines the export competition between Ethiopian and Kenyan commodities in nine selected European countries, (Germany, the Netherlands, Italy, France, the United Kingdom, Denmark, Finland, Sweden, and Spain) because they are the highest importers of Ethiopian and Kenyan products in Europe. The monthly time-series data covers the years 1993-2016. By refining a simple demand model of Seo and Kang (2016), the degree of competition has been estimated. This experiment has been conducted based on the Standard International Trade Classification (SITC) 05, 07, and 29 at a 2-digit level of products. The overall empirical results show that Kenya has a higher competitiveness in most exports compared to those of Ethiopia, in the nine selected European countries. Moreover, a decrease of relative price has had a positive and significant influence on the increase of Kenya's exports. Whereas, an increase of an importing countries income encourages exports from Ethiopia significantly. In addition, the potential export threat is calculated using the Rivalry Threat Index (RTI) at SITC a 4-digit level in order to investigate the export threat at the disaggregated level of products whereby the estimation of elasticity of substitution cannot be performed. Although, the results from the estimation of elasticity suggested that Kenya had a higher competitiveness in most products against exports from Ethiopia, the RTI result exhibits that Kenya also faces a higher degree of export threat against exports from Ethiopia at the SITC 4- digit level in SITC 0545, SITC 0546, SITC 0548, SITC 0579, SITC 0711, SITC 0751, SITC 2911, SITC 2922 and SITC 2729 products.

Keywords: Export Competition, Elasticity of Substitution, Simple Demand Model, Rivalry Threat Index, Ethiopia, Kenya

유럽연합에서 에티오피아와 케냐의 수출 경쟁

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국문초록

수출의 상대적 경쟁력은 수출 수준을 결정하는데 중요한 역할을 한다. 개발도상국과 저개발국가에게는 외환보유고 신장, 무역수지 적자 해소, 사회전반을 위한 삶의 질 개선을 가져다 줄 고용을 제공하는 것이 특히 중요하다. 불행하게도 국가간에 지역이나 경제 차이로 인하여 국제경쟁은 아직도 아주 많은 도전에 직면해 있다. 이러한 도전은 에디오피아와 케냐 같은 개발도상국을 더욱 어렵게 하는데, 왜냐하면 그들의 경제가 불과 몇 개의 다양화 되지 않은 농업 같은 1 차 상품에 기반을 두고 있기 때문이다. 본 연구는 9 개의 선택된 유럽국가(독일, 네덜란드, 이탈리아, 프랑스, 영국, 덴마크, 핀란드, 스웨덴, 스페인)에서 에디오피아와 케냐의 수출 경쟁을 검토할 것이다. 9 개 국가를 선택한 이유는 유럽 9 개 국가는 유럽 내에서 에디오피아와 케냐의 최대 수입국이기 때문이다. 월간 시계열 데이터는 1993 부터 2016 년까지의 데이터를 사용하였다. 경쟁수준은 서와 강(2016)의 단순수요모형을 개량하여 추정하였다. 본 실험은 표준국제무역분류(SITC) 05, 07 그리고 29(2-digit)에 기초하여 처리했다. 종합적인 실증분석 결과는 9 개의 유럽 국가에서 케냐는 경쟁국인 에디오피아와 비교하여 대부분의 수출에 더 높은 경쟁력을 가지고 있다는 것을 알 수 있다. 더욱이 상대적 가격의 하락은 케냐 수출의 증가에 긍정적이고 중대한 영향을 미쳤다. 반면 수입국의 소득 증대는 에디오피아로부터 수출을 현저히 촉진시키고 있다. 게다가 잠재수출위협은 대체탄력성의 평가를 수행할 수 없는 군별 수준의 제품들에서 수출 위협을 조사하기 위해서 표준국제무역분류 4-digit 개별 수준에서 경쟁위협지수(RTI)를 사용하여 계산하였다. 비록 대체탄력성의 결과에서는 케냐가 에디오피아 수출품과 비교해 대부분 제품에서 더 높은 경쟁력을 가지고 있는 것으로 나타났지만, 경쟁위협지수 결과는 케냐가 SITC 0545, SITC 0546, SITC 0548, SITC 0579, SITC 0711, SITC 0751, SITC 2911, SITC 2922 and SITC 2729 제품들에서 표준국제무역분류(SITC) 4-digit 개별 수준으로 에디오피아 수출에 비하여 더 높은 수출 위협 정도에 직면해 있음이 드러났다.

키워드 : 수출경쟁, 대체탄력성, 단순수요모형, 경쟁위협지수, 에디오피아, 케냐

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Chapter 1- Introduction

Globalization is a key driver for economic integration that brings competition between nations and international corporations. Export competition is helpful for the economic outlook of any nation, and it can also encourage nations or firms to accomplish a full capacity of production (Mussa, 2000).

International organizations such as the World Trade Organization (WTO) are working to make it easier for nations to trade amongst each other and have put forward a number of new initiatives. These help international competition, by promoting free trade and eliminating anti-competitive practices of nations such as price dumping, price fixing and limit pricing (Anderson and Müller, 2017). Moreover, the creation of free trade zones and a reduction of trade barriers have come a long way in facilitating international trade and in turn, competition among nations. In addition, globalization has introduced advances in technology and a higher volatility of the international goods market. All these elements lead to an important and continuing reshuffling of the international patterns of export competition.

It is well known that export development is very important for developed and under developing nations. It can boost their foreign exchange reserves, reduce their balance of payment deficits, and provide employment. All of which can provide an improved standard of living in all nations.

Unfortunately, due to regional and economic differences between nations, international competition still faces many challenges. These challenges are more difficult in developing countries such as Ethiopia, since their economy is based on only a few undiversified (agricultural) primary commodities.

The main challenge faced by most low income countries is the higher quality controls imposed by developed nations on the exports of primary commodities (Asfaw *et al*., 2010). That and the lack of diversification in horticultural products, which show a very low performance in most low income countries (Keno, 2011). These reasons have led to countries to underperform in the international market.

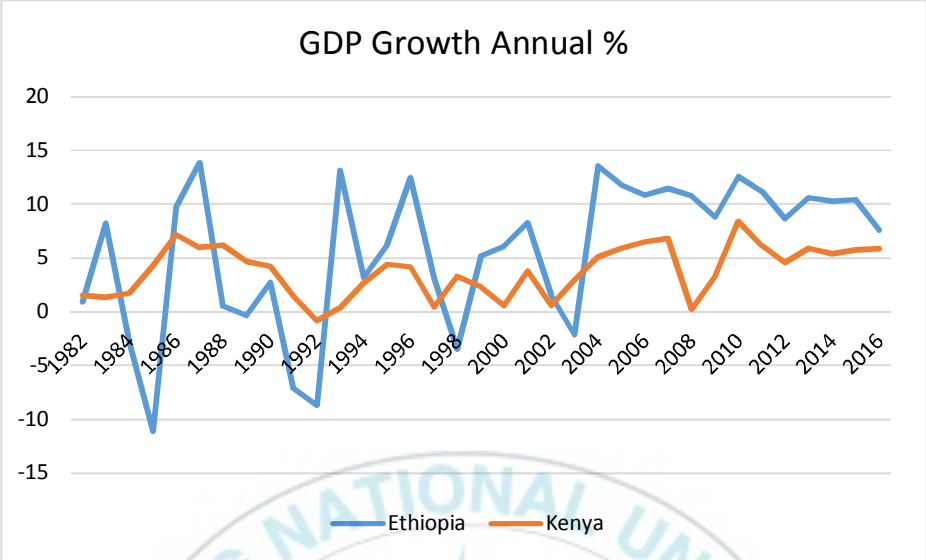
There are many studies that address the general problem of why low income countries do not perform well in the international market, why their exports are not diversified, and why they produce low quality products (Ne and Yeats, 2005; Asfaw *et al*., 2010; Murekezi *et al*., 2014; Tye *et al*., 2011; looi Kee *et al*., 2009; Ashraf *et al*.,2011). Conversely, there are studies that focused on the export competition between nations and the measurement of export similarity indices (Zeng and Ka, 2010; Wang and Liu 2015; Jenkins, 2008). These previous studies have only focused on the export competition between developed countries. So, there has been a lack of studies that focus on export competition and the similarity index between Ethiopia and Kenya, in the European Union. This research paper investigates and estimates whether Ethiopia or Kenya's exports outperformed each other in nine

European markets (Germany, the Netherlands, Italy, France, the United Kingdom, Denmark, Finland, Sweden and Spain) by measuring competition between the exports of both countries.

1.1. Economic Overview of Ethiopia and Kenya

Ethiopia and Kenya are countries that are located in the Eastern part of Africa which share a common border. Along with their location, they also share a similar climate. These two countries maintain strong trading ties. They are members of the Common Market for Eastern and Southern Africa (COMESA), the African Free Trade zone (AFTZ), and the Intergovernmental Authority on Development (IGAD) trading blocs. Both countries are showing rapid economic development, especially in urban development, Foreign Direct Investment (FDI), international trade and economic policy reform. However, the exports of these two countries still lag behind the rest of the world. According to the Organization for Economic Co-Operation and Development (OECD) in 2016 Ethiopia exported $1.71 billion and imported $19.1 billion, whilst Kenya exported $ 5.25 billion and imported $17.6 billion, which resulted in a total negative trade balance of $17.3 billion for Ethiopia and $12.35 billion for Kenya. This higher level increase in total trade deficit comes from both the agricultural and industrial sectors, and it affects both countries in a negative way (Gebeyehu, 2015).

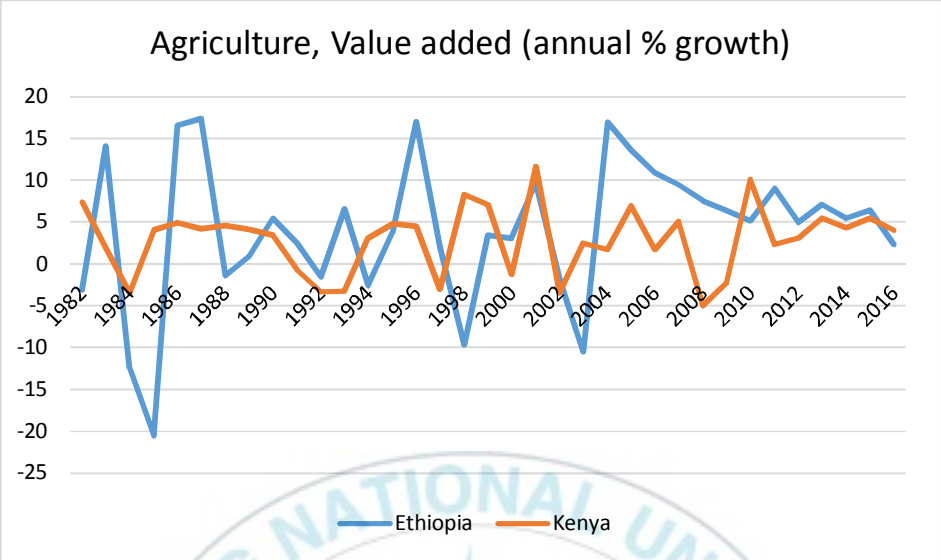
Figure 1: Ethiopia and Kenya's GDP Growth in Percentage (1982-2016)



Source: The World Bank National Accounts Data

As can be seen from the above figure, the Gross Domestic Product (GDP) growth of Ethiopia from the year 1982 to 2004 was unsustainable. However, from the year 2005 to the present, the GDP growth has been stable, even if it is has recently showed a slight percentage decrease. Whereas, Kenya's GDP growth looks more sustainable over the same period. Overall, figure 1 indicates slow GDP growth in both countries.

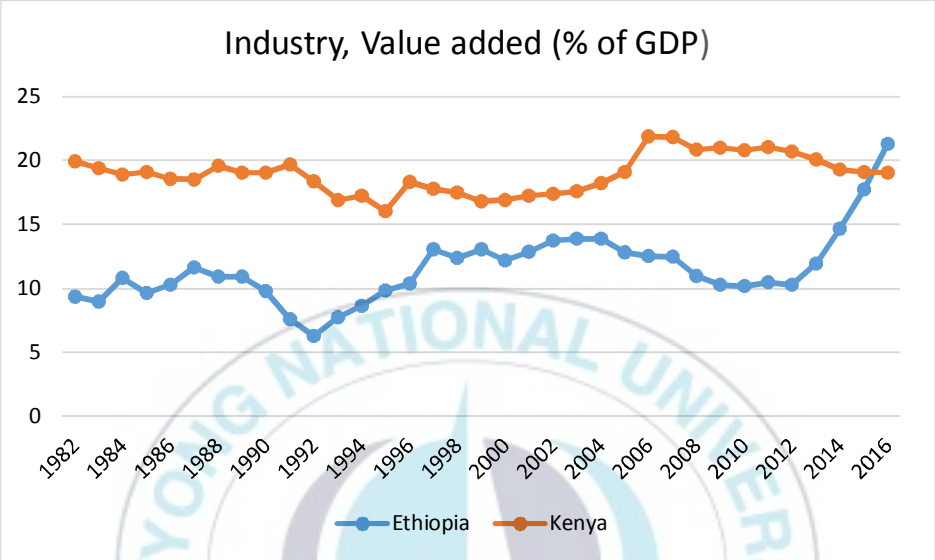
Figure 2: Ethiopia and Kenya's Agriculture, Value Annual, percentage growth (1982-2016)



Source: The World Bank National Accounts Data

The agricultural sector contributes the most towards the GDP of both Ethiopia and Kenya where the primary sector is very important. As presented above in figure 2, the agriculture value added annual growth of Ethiopia has dropped from the year 2012 to the present. Kenya's value added annual growth has also been dropping since 2015. The main reason for this rapid decline is because of the (El- Nion) drought. This happened in the second half of 2015, which led to subdued agricultural production and thus reduced the value of agricultural products. Likewise, limited demand for traditional exports is also a reason for the decline (Mulugeta, 2014). In general, the declining demand for primary products has had a detrimental effect on other non-traditional (processed) agricultural products.

Figure 3: Ethiopia and Kenya's Industry, Value Added, percentage of GDP (1982-2016)

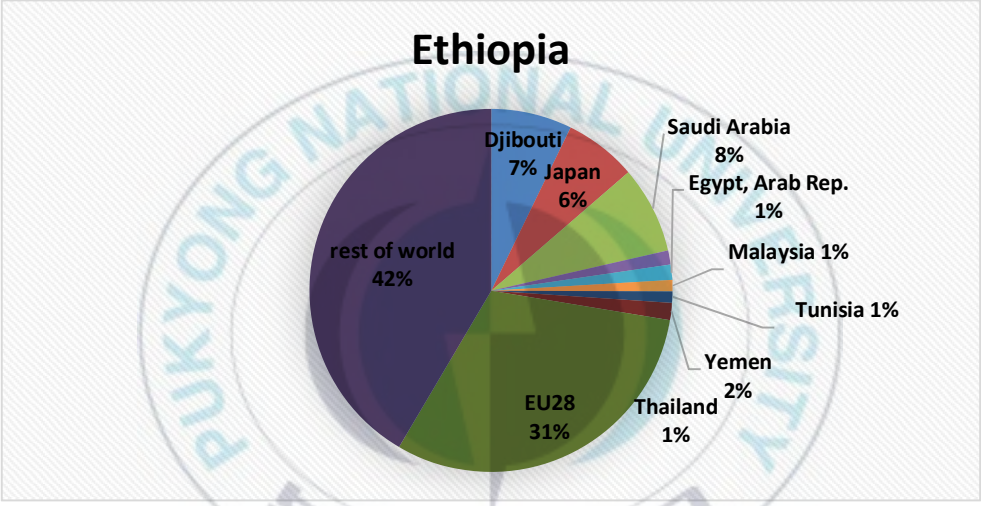


Source: The World Bank National Accounts Data

Conversely, the industry sector has significantly increased for Ethiopia from the year 2012 to present. However, this only contributes 4 percent to the overall economy. One of the reasons why the industry sector remains low, is a lack of infrastructure and government support. While, Kenya's industry sector has been stable, as can be seen in figure 3 above, but has also started decreasing slightly since 2008. This is due to the majority of consumer goods being imported from China, the European Union (the EU) and the United States of America (the US). Additionally, investment in the industry sector remains relatively weak. Shiferaw (2017), found that about 50 percent of Ethiopian manufacturing firms have had a

zero investment. This proportion rises to 70 percent among small firms that employ less than 50 workers. Among the firms with a positive investment rate, the majority have had investment rates that are far below the frequently used 10 percent depreciation rate.

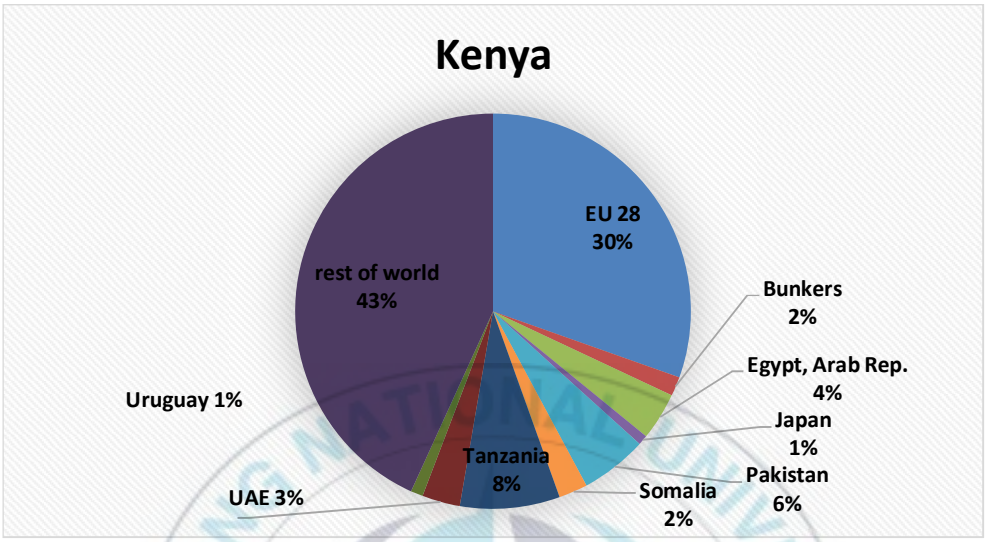
Figure 4: Ethiopia's Top 10 Export Partners (1995-2016)



Source: The World Integrated Trade Solution Database, (WITS)

Ethiopia's exports to different areas of the world is shown in the above figure 5, so we can see that 31 percent, which makes up the highest share of Ethiopia's exports, goes to the EU 28. The most important trade destinations for Ethiopia are Germany, France, Sweden, Italy and the UK. Ethiopia's bilateral trade relations and economic development with the EU have been ongoing for over 42 years. The next most important Ethiopian market, after the EU 28, are Saudi Arabia, Djibouti and Japan.

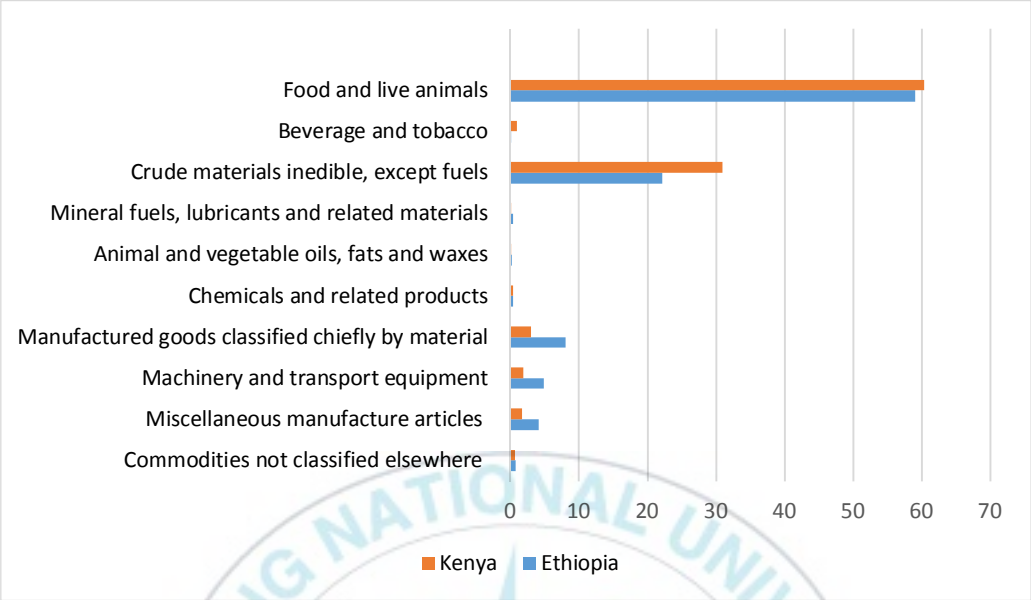
Figure 5: Kenya's Top 10 Export Destinations (1995-2016)



Source: Author's calculations data from World Integrated Trade Solution (WITS)

As in Ethiopia, figure 5 shows that 30 percent of total exports from Kenya go to the EU 28. The majority being to the UK, the Netherlands, France and Germany. The rest of the share goes mostly to Pakistan, Egypt and the United Arab Emirate (UAE). Thus, we can conclude that the EU market is crucial for both Ethiopia and Kenya's economies.

Figure 6: The Structure of Exports from Ethiopia and Kenya to the EU (1993-2016)



Source: International Trade Statistics Database, UN Comtrade

As mentioned above, agriculture is the backbone of the Ethiopian and Kenyan economies, and as shown in figures 5 and 6, the EU is the main export destination for both Ethiopia and Kenya. Additionally, based on figure 7, the main products of Ethiopia's exports to the EU 28 are SITC 0 (food and live animals) which accounts for 59.09 percent of total exports. The main products of Kenya's exports to the EU28 are also SITC 0 (food and live animals) which accounts for 60.31 percent of total exports. The second biggest export products for both Ethiopia and Kenya are SITC 2 (crude materials inedible, except fuels), which accounts for 22.22 percent of the total exports for Ethiopia, and 30.87 percent for Kenya. This indicates that the share of primary commodities are important for both countries. Therefore, a

study on export competition between Ethiopia and Kenya in the EU market is essential. This is because these two countries tend to export similar products to similar destinations. This implies that there is a high level of competition between Ethiopian and Kenyan exports. So, knowing which products Ethiopia or Kenya have a higher (or lower) export competitiveness in will help them to determine a trade strategy for each of the nine selected EU.

1.2. Statement of the Problems

The volume of total exports from Ethiopia and Kenya has not changed significantly in the past two decades. This indicates that the production structures of the countries have not changed, especially, in the agriculture sector. Both of these countries are still highly dependent on and also rely on the primary sector. Likewise, the fact that these two countries are very similar in the case of location, climate, and economy, means they tend to produce similar kinds of products. Thus, studying the export competition between these two countries will introduce important policy implications regarding which products they need to focus on to achieve a more rapid export development. There has been a lack of literature in this area, since most of the previous studies have focused only on developed countries. This study aims to alter the focus to the developing economies of Ethiopia and Kenya.

1.3. Significance of the Study

The main point of this research is to investigate exactly which products Ethiopia and Kenya are losing market share to in the EU, and to show to what degree they are losing or gaining from those specific products against each other. Their governments will be able to see the level of their export performance in the selected nine EU countries. Furthermore, the study will provide policy implications and recommendations to the governments of both countries, and this will show how they should emphasize and support the exports of those products in which they have lost a competitive advantage.

Finally, this study will be invaluable for future researchers who want to study why Ethiopia or Kenya are losing the market share on specific products against each other in the EU market, and for other related themed studies.

1.4. Research Objectives

The main objective of this research is to investigate and estimate whether Ethiopia or Kenya's exports outperformed each other in nine European markets (Germany, the Netherlands, Italy, France, the United Kingdom, Denmark, Finland, Sweden and Spain) by measuring competition between the exports of both countries. Thus, the broad objectives of the study are:

First, to empirically examine which industries in Ethiopia or Kenya have higher or lower export competitiveness in those selected nine EU countries.

Second, to investigate the potential export threats which Ethiopia, or Kenya, may encounter caused by higher levels of export competition against each other.

Third, to make policy implications and forward recommendations.

1.5. Research Hypothesis

Based on the above objectives, two general hypothesis will be empirically tested:

Hypothesis 1: Kenya has a higher export competitiveness in the selected nine EU countries, compared to Ethiopia.

Hypothesis 2: Ethiopia is encountering a higher export threat from Kenya.

1.6. Structure of the Study

This study is structured in five chapters. The first chapter covers the introduction, an economic overview of Ethiopia and Kenya, a statement of the problems, the significance of the study, the research objectives, the research hypothesis, and the structure of the study. The second chapter presents the theoretical and empirical literature reviews. In the third chapter, the model specification, and techniques to be used in the data collection are displayed. The fourth chapter discusses the empirical results and analysis. Finally, the fifth chapter presents the conclusions and recommendations based on the main findings.

Chapter 2- Literature Reviews

Exports are one of the main tools to open up opportunities to expand production, reduce unemployment, and improve household income. To increase exports, a country should have the ability to produce and sell goods and services in foreign markets at a price and quality that ensures long term viability and sustainability. However, without strong competitiveness, a nation cannot achieve these goals. As Porter and Van der Linde (1995) stated, a country's competitiveness is determined on the capacity of its exports to be of high value and quality. The issue on export competitiveness has been broadly examined in both theoretical and empirical studies through various trade methodologies and indexes. Most of the studies are based on export competition between two or three developed countries. However, not many studies have been made on export competition between developing nations. The subsequent sections discuss the theoretical and empirical studies regarding export competition and measurements.

2.1. Theoretical Reviews

Smith (1976) classical theory of absolute advantage explains international trade, and he argued that a greater output of a good or service produced by a country that has an absolute advantage as opposed to other countries still having the same amount of resources. He also argued that a country should concentrate on production of goods in which it holds an absolute advantage. According to Smith, countries with no absolute advantage in the production of any goods or services are

not considered benefited as they lack of trade existence. On the other hand, Fagerberg (1988) defined a country's competitiveness as "the ability to sell in foreign markets". In the long run, competitiveness of a country depends on its natural resources, stock of machinery and equipment, and the skills of workers in creating goods and services that people want to buy. The ability of a society to do this effectively determines whether it can remain competitive in the global economy (Buckley *et al*., 1988).

However, modern days of international trade theory export competiveness can be measure by the volume of one country's exports compared with that of another country's in the international trade market. Also, the relative position of a country or a product in the international markets and its dynamic over time, can indicate the level of competitiveness (Negrea, 2015).

Erkan and Yildirimci (2015), define a country's competitiveness to an increase in its exports in the international market on its ability to invest in research and development. The competiveness of a country with international trade can be influenced by many different factors, such as changes in exchange rates, different growth rates of other countries export production, changes in subsidization or taxation on exports, changes in differing qualities of export goods or different developments of new export goods, different changes in export orders from one country to another, (import commodities that are transferred immediately) and

changes in export price (Desai and Hines Jr, 2001). All of these factors may lead a country's exports to be substituted by another country which has performed better with these subjected factors.

The substitution effect is caused by an increase in price that induces a consumer (whose income has remained the same) to purchase a relatively lower-priced good and less of a higher-price one. The substitution effect is always negative for exporters (sellers), however, the importer (consumers) always switch away from spending money on higher-priced goods to lower-priced ones, as they attempt to maintain their living standard in the face of rising prices.

2.1.1. Elasticity of Substitution

I. Price Elasticity of Demand

Elasticity of demand measures the degree of responsiveness from the quantity demanded of a commodity to change in its price. Thus, its measure depends upon comparing the percentage change in the price with the percentage change of the quantity demanded.

II. Price Elasticity of Supply

Elasticity of supply is measured as the ratio of the proportionate change in the quantity supplied to the proportionate change in price. High elasticity indicates the

supply is sensitive to changes in prices, low elasticity indicates little sensitivity to price changes, and no elasticity means no relationship to price.

III. Income Elasticity

Income elasticity of demand measures the degree of responsiveness of the quantity demanded of a product to changes in income.

Elasticity of income = Percentage change in quantity demanded over Percentage change in income. For most commodities, increase in income, leads to an increase in demand, and, therefore, income elasticity is positive.

2.2. Empirical Reviews

There have been numerous empirical studies about the export competition between two countries in a third market, by estimating the value of the elasticity of substitution by focusing only on the response of trade to price changes or demand side (Kravis and Lipsey, 1972). This means it is only assumed that the elasticity of demand for two goods are equal and the price elasticity in demand for two goods are identical, but the supply side has been ignored (Brakman and Jepma, 1990). However, Armington (1969) modified the original model by adding a consumer's recognition, because products traded globally are differentiated by country of origin. The modified elasticity model has been used widely to analyze the degree of substitution between imported and domestic goods (Mc Daniel and Balistreri, 2003). Most economists have used aggregate trade data in attempts to estimate the

responsiveness of demand to international prices by using different methods as follows:

Wilson (2000), investigated export competitiveness between Singapore, Thailand, Malaysia, Korea, Taiwan and Hong Kong to the USA, Japan and the EU. This study used the dynamic shift - share methods at a 2-digit data level for manufacturing products. This study found that Thailand is more competitive relative to the other countries. It also suggested switching to higher value-added manufacturing to, services or new markets, or to establish manufacturing facilities overseas as a substitute for exports. He (2012), also undertook an investigation in competition among the Association of Southeast Asian (ASEAN) members in East Asian markets, by applying shift share analysis. This study found that Indonesia and Malaysia are highly competitive in East Asia.

Similarly, Wilson *et al*. (2007), used shift share methodologies to examine the export performance of China in electronics, compared to the East Asian countries exports to the USA. The research found the East Asian countries, and the less developed members of ASEAN would appear to be at the most risk in the immediate future. Since they compete head on with China in lower-end manufacturing, they are in danger of being 'leapfrogged' in the value-added chain. In order to evaluate the demand- side of India's textile and clothing exports Verma (2002), examined the competitive performance of Indian exports of the identified products in the US and EU markets, the overall results showed that Indian industry

especially the garment sector, has great potential, but the sector needs a lot of improvement in order to unlock this latent capability. Also, Ceglowski (2017) examined this study, and has evaluated countries' export competitiveness in five industries, three manufacturing, and two service industries associated with Global Value Chains (GVC).

Olarreaga *et al*. (2004), investigated export supply and import demand elasticity's for over 4,200 goods in 117 countries. The estimated elasticity of import demand reveals a significant variation across countries and products. The study showed that heterogeneous products are less elastic than homogenous goods. In developed countries, import demand tends to be more elastic, which may be due to a larger availability of domestic substitutes, which means, the price sensitivity to imports are expected to be larger. This means it is easier to substitute away from imports into domestically produced goods in large or developed economies.

Algieri (2004), found that the response of exports to income changes is instantaneous, although the effect of competitiveness on exports is quite small in the short-run. In the short-run, the exports of Russia are dominated by real domestic and world income that become vital in the determinant of the country's economic performance. Similarly, in the long-run, an increase in exports is also caused by a growth in real world income, while an increase in domestic income results in a drop of exports. The high long-run elasticity of world income implies that the value of exports substantially increases when world income rises.

Were *et al*. (2014), studied Kenya's export performance using a time series data and research on factors which have influence Kenya's export volumes by disaggregating total exports of goods and services into three categories of traditional agricultural exports of tea and coffee, and 'other exports of goods and services'. They found that the proportion of GDP has been declining. Also, the income of trading partners was found to be the main reason for decline in export volumes of 'other exports' other than coffee and tea.

Sun (2010), research on the competitive strategies for Chinese mushroom export to the Japanese market by employing the SWOT method. The study found that Chinese mushrooms have a good market in Japan because of the low price but the quality of Chinese mushrooms are not good therefore, the demand for Chinese mushroom is decreasing. However, if Chinese mushrooms have a comparative advantage over other mushroom exporters, the Japanese domestic mushrooms are taking the place of the Chinese mushrooms.

Karamuriro and Karukuza (2015), studied determinates of Uganda's export performance by using the gravity model. They used the panel data from 1980-2012 and the results showed that Uganda's GDP, its importer's GDP and importer's GDP per capita, the difference between Uganda and its trading partners, the real exchange rate, the official common language, and contiguity have all had a positive and statistically significant effect on Uganda's exports.

Kim and Kim (2015), studied the revealed comparative advantage (RCA) of South

Korea and its major ASEAN trading countries in the manufacturing sector for the period of 2000-2010 found that South Korea exported products by using lower skilled human capital intensive and more R&D intensive for most of that period. Indonesia, Thailand, and Vietnam are found to have exported products by using lower physical and skilled human capital and lower R&D intensive for the entire period. Also, Malaysia and the Philippines exported products by using lower physical and skilled human capital intensive, and Singapore was found to have export products by using more R&D intensive for the entire period.

Based on the above literature reviews, one major point is taken into consideration. Most of the exciting literature studied by using the RCA and SWOT models. Moreover, these studies used aggregate trade data which only helped to see the general outline of the export competition. Therefore, there is need for more specific research to investigate which exact products Ethiopia and Kenya are losing markets to in the EU, and to show to what degree they are losing or gaining from those specific products against each other.

Chapter 3- Research Methodology

This chapter presents the model specification, research data and methods that are used in this study, to estimate the export competition and the possible threat on exports between Ethiopia and Kenya in the selected nine European countries (Germany, the Netherland, Italy, France, the United Kingdom, Denmark, Finland, Sweden and Spain).

3.1. Model Specification

3.1.1. Estimation of Elasticity of Substitution: Simple Demand Model

Elasticity of substitution is a measure that shows the responsiveness of consumers of a good or service to the price changes in its substitutes. It can be measured as the ratio of proportionate change in the relative demand for two goods, to the proportionate change in their relative prices. It shows to what degree two goods or services can be substituted for one another.

The simple demand model to elasticity of substitution was developed by Tinbergen (1946) and Harberger (1957) . It is presented as the following:

$X = F(Y)$, Where $X = \left(\frac{Q_1}{Q_2}\right)$ and $Y = \left(\frac{P_1}{P_2}\right)$

Where, Q_1 and Q_2 = the amounts of good 1 and good 2, P_1 and P_2= the respective prices

The elasticity of substitution (EL) can be written as:

$$EL = \left(\frac{X}{Y}\right)\left(\frac{dy}{dx}\right)$$

The above equation should be specified in the logarithmic (log) form. The log form of the elasticity (β) can be derived as:

$$\beta = d\left[\frac{ln\left[\frac{Q_1}{Q_2}\right]}{ln\left[\frac{P_1}{P_2}\right]}\right]$$

In reference to the above elasticity of substitution log form, the value of β_1 will be estimated as the following:

$$ln\left(\frac{Q_1}{Q_2}\right) = \beta_0 + \beta_1\left(\ln\left[\frac{P_1}{P_2}\right]\right) + \varepsilon$$

Where β_1 is constant and ε is error term.

The above equation was used by Seo and Kang (2016). For the purpose of this paper, we adopted the above equation by modifying only the variables as follows:

$$ln\left(\frac{EQ}{KQ}\right) = \beta_0 + \beta_1\left(\ln\left(\frac{EUP}{KUP}\right)\right) + \varepsilon \quad (1)$$

Where,

EQ = Quantity of Ethiopia's goods exported into the EU market;

KQ = Quantity of Kenya's goods exported into the EU market;

EUP = Price of Ethiopia's goods exported into the EU market;

KUP = Price of Kenya's goods exported into the EU market;

β_1 = Elasticity of substitution between Ethiopia and Kenya exports in the EU market;

ε = Error term.

However, Seo and Kang's (2016), equation presented only two variables, price and quantity. There is a general argument that income and the real exchange rate may also affect values of exports.

Therefore, (Eq.1) is modified in this study by adding the income of an importing country and the bilateral real exchange rate. Henceforth, it is considered a main factor for determining the importing countries demand for goods from exporting countries.

$$\ln\left(\frac{EQ}{KQ}\right)_t = \beta_0 + \beta_1 \left(ln\left[\frac{EUP}{KUP}\right]\right)_t + \beta_2\, ln(Y)_t + \beta_3 ln\left(\left[\frac{EXG}{KXG}\right]\right)_t + \varepsilon_t \qquad (2)$$

Where,

$EQ =$ Quantity of Ethiopia's goods exported into the EU market;

$EK =$ Quantity of Kenya's goods exported into the EU market;

$EUP =$ Price of Ethiopia's goods exported into the EU market;

$KUP =$ Price of Kenya's goods exported into the EU market;

$Y =$ Income of the EU;

$EXG =$ Bilateral real exchange rate between Ethiopia and each EU country;

$KXG =$ Bilateral real exchange rate between Kenya and each EU country;

$\beta_1 =$ Elasticity of substitution between Ethiopian and Kenyan exports in the EU market;

$\varepsilon =$ Error term.

To understand the competitive relationship on the exports of Ethiopia and Kenya in the nine selected countries, this study first estimates the elasticity of substitution using equations (1) and (2), respectively. By using this approach, we can see the changes in the estimations, because equation (1) has only two variables (price and quantity) and equation (2) which added two more variables (the income level of the importing country and the bilateral real exchange rate). The results of the two equations may be different from the results of the estimated values of the elasticity of substitution.

Hence, the estimation that we get from equation (1) and (2) will show us the degree of competition in the relationship between Ethiopia and Kenya within the nine selected EU countries. Therefore, based on the theory of elasticity of substitution, if there is a high elasticity of substitution between the exports of the two countries in a third market, then one countries' exports are substituted for another countries'

exports. This means that the country may lose their competitiveness of their own exports. Thus, if the value of elasticity of substitution (β_1) in Eq.2 is elastic (greater than 1), this means a small reduction in price of an Ethiopian product encourages an increase in exports from Ethiopia significantly, relative to the exports from Kenya. Hence, the high value of (β_1) indicate that Ethiopian products have a higher competitiveness against the one from Kenya in the selected EU countries and vice versa. On the other hand, if the value of elasticity of substitution is inelastic (less than 1), this means the selected export products from Ethiopia and Kenya are small in the EU market. Furthermore, the value of income (β_2) shows, increases in income of an importing country should create a higher demand for imports, but it depends on the magnitude of the increases in exports from Ethiopia and Kenya. And, the bilateral real exchange rate (β_3) is expected to have a positive value, because of the depreciation of the currency which promotes exports.

However, using only a 2-digit level will limit our research for precise analysis. Since, there are few countries and products that could not be estimated through the elasticity of substitution, due to a lack of data availability. Therefore, in order to measure the degree of threat that Ethiopia, or Kenya, may encounter in the selected nine EU countries, at a disaggregated 4- digit level, we employed the RTI index. Thus, the export competition between Ethiopia and Kenya to the EU market be investigated through the elasticity of substitution simple demand model and the

export threat from Ethiopia, or Kenya, in the selected EU countries will be examined through the RTI index.

3.1.2. The Rivalry Threat Index (RTI index)

International trade competitiveness has been measured through several trade indexes. The most commonly known measures are the exports similarity index K-F index, (Finger and Kreinin, 1979) and the Grubel-Lioyd index, GL, (Gruber and Lloyd, 1975).

The K-F index is used to compare the export similarity of two countries in a third importing market. Uprasen (2011), argued with the idea of the K-F index, by saying that the index only focused on the similarity between the composition of exports of the two countries, rather than the degree of competition between them. In other words, the K-F index assumed that export competition between country A and country B in a third market, country C, considered both countries A and B had the same size of export. Therefore, the K-F index did not take the size of the exporting country into account, because when the sizes were not the same, we can get a misleading result. When the product similarity index changes over time, we find that the export form of the two countries converges together.

Additionally, five main points that show weakness of the K-F index. First, the K-F index is suitable for measuring the export similarity at the aggregate product level. It is not applicable at a single product level. Second, the K-F index measures the

similarity between the composition of exports of the two countries rather than the degree of competition between them. Third, the size of exports from each exporting countries does matter, but it is not taken into account by this index. Fourth, the value of the degree of rivalry for a pair if exporting competitors into a third destination is not the same or identical. Fifth, all the current indexes for measuring export similarity and the degree of competition of a particular exporting country measures the degree of competition across markets in one particular product. There is no index that measures the degree of export competition across markets in one single product.

On the other hand, the Grubel-Lioyd index (GL) is used for determining the extent of intra-industry trade. However, many scholars believe that one of the reasons is that the GL index mostly works on an aggregation level, so when the data became highly disaggregated, products that should be in the same industry will be seen as if they are not from the same industry (Lindqvist, 2006).

However, the Rivalry Index (R index), Fung and Iizaka, (1998) is by far the most authoritative trade index measurement by taking the size difference of exports between country 1 and 2 into account. However, the index only gives a single value of the degree of similarity for a pair of countries. Since, there are some limitations on the original R index, we adopt the Rivalry Threat Index (RTI) developed by Uprasen, (2011). The RTI index is a revised version of the Rivalry index (R

index).The RTI is designed to measure the degree of export competitive threat at the level of each particular product of any exporting country across both its competitors or in one particular market and its destination.

The original R index

$$R_i = 1 - \frac{\left|X_{AC}^i - X_{BC}^i\right|}{\left(X_{AC}^i + X_{BC}^i\right)}$$

Where,

R_i = Rivalry index of product i (or industry i)

X_{AC}^i = Exports of industry i from exporting country A to destination country C

X_{BC}^i = Exports of industry i from exporting country B to destination country C

The RTI index, revised version of the Rivalry index (R index).

$$RTI_{AB\perp C}^i = \left[1 - \frac{\left|X_{AC}^i - X_{BC}^i\right|}{\left(X_{AC}^i + X_{BC}^i\right)}\right] * \frac{X_{AC}^i}{\sum_z X_{AZ}^i} \quad (3)$$

Where,

$RTI_{AB\perp C}^i$ = Rivalry threat index between A and B in destination C, from the point of view of exporting country A

$X_{AC}^{i} =$ Exports of product i from the exporting country A to the destination country C

X_{BC}^{i} = Exports of products i from exporting country B to destination country C

X_{AZ}^{i} = Exports of product i from exporting country A to any destination Z

Therefore, $\frac{X_{AC}^{i}}{\sum_{z} X_{AZ}^{i}}$ represents the exports of product i from country A to the world and $\frac{X_{AC}^{i}}{\sum_{z} X_{AZ}^{i}}$ is the share of exports of product i from country A to destination country C related to total exports of product i by country A. The (latter Z) ratio represents the relative size of the exporting market of product i from the point of view of country A. The RTI index shown in Eq. 3 is used for measuring the degree of competition of product i with country B in destination country C, from the point of view of exporting country A. The value of RTI rests between zero and one. The higher the value of RTI, the greater the degree of rivalry export threat from the point of view of the exporting country.

There are two main advantages the RTI provides, which the R index misses out. First, the RTI points out each competitor will encounter a rivalry threat, and the degree of the export similarity threat is different between exporting countries, but the R index does not capture this. Second, the RTI can measure the degree of potential export threat to different destinations or for one particular product i in

more detail, which the R index does not take into account. Therefore, the RTI index will be employed in this research.

3.2. Research Data

The following are data descriptions from the two sections of the research. The first part of data for the estimation of elasticity of substitution is a monthly time series, with seasonally adjusted data from the years 1993 to 2016, on exports from Ethiopia and Kenya to nine of the selected EU countries.

The data is organized according to the Standard International Trade Classification (SITC) 2-digit Rev.3 commodity codes under SITC 0, SITC 05 (vegetable and fruits) and SITC 07 (coffee, tea, cocoa, spices and manufactured thereof) and under SITC 2, SITC 29 (crude animal and vegetable materials) and the data of quantity exported from Ethiopia and From Kenya to the nine EU countries are obtained from Eurostat databases.

However, export data for all the EU countries are not available, therefore we selected different countries for each SITC classifications as the following: for SITC 05 (France, Germany, Italy and the Netherlands), for SITC 07 (Germany, the Netherlands, Italy, France, the UK, Denmark, Finland, Sweden and Spain), and for SITC 29 (German, Italy, the Netherlands and the UK). Unfortunately, due to the lack of the real price data for all commodities, this study used proxy variables (value of export/ quantity of export), according to a method recommended by Richardson

(1972). The industrial production index, as a proxy for the selected nine European countries GDP (income), the data collected from the International Monetary Fund (IMF)'s International Financial Statistics. Lastly, the real bilateral exchange rate between Ethiopia and the nine EU countries and Kenya and the nine EU countries comes from Bruegel.org in current US dollars.

The second part of the data for calculating the Rivalry Threat Index (RTI), is organized based on the SITC at the disaggregated level of product 4- digit Rev.3. Under SITC 05, we selected 0541 (Potatoes, fresh or chilled not including sweet potatoes), 0542 (Leguminous vegetables, dried, shelled, whether or not skinned or split), 0545 (Other fresh or chilled vegetables) , 0546 (Vegetables (cooked or uncooked by steaming or boiling in water), frozen), 0548 (Vegetable products, roots and tubers, chiefly for human food, n.e.s., fresh or dried), 0561 (Vegetables, dried (excluding leguminous vegetables), whole, cut, sliced, broken or in powder, but not further prepared), 0599 (Juice of any single fruit (other than citrus) or vegetable; mixtures of fruit or vegetable juices), 0577 (Edible nuts (excluding nuts chiefly used for the extraction of oil), fresh or dried, whether or not shelled or peeled), 0579 (Fruit, fresh or dried, n.e.s).

Under SITC 07, we selected 0711 (Coffee, not roasted, whether or not decaffeinated; coffee husks and skins), 0712 (Coffee, roasted), 0741 (Tea, whether or not flavored),

0751 (Pepper of the genus Piper; fruits of the genus Capsicum or of the genus Pimenta, dried or crushed or ground), 0752 (Spices except pepper and pimento).

Finally, under SITC 29, we selected 2911 (Bones, horns, ivory, hooves, claws, coral, shells and similar products), 2919 (Materials of animal origin, n.e.s.), 2922 (Lac natural gums, resins, gum resins, and balsams) 2923 (Vegetable materials of a kind used primarily for plaiting (e.g., bamboos, rattans, reeds, rushes, osier, raffia, cleaned, bleached or dyed cereal straw, and lime bark), 2924 (Plants and parts of plants (including seeds and fruits) of a kind used primarily in perfumery, in pharmacy, or for insecticidal, fungicidal or similar purposes, fresh or dried, whether or not cut, crushed or powdered). 2925 (Seeds, fruit and spores, n.e.s., of a kind used for sowing), 2926 (Bulbs, tubers and rhizomes of flowering or of foliage plants; cuttings, slips, live trees and other plants), 2927 (Cut flowers and foliage), 2929 (Materials of vegetable origin, n.e.s.). All the data for the RTI are collected from Eurostat databases.

3.3. Data Testing Tools

3.3.1. Unit Root Test: The Augmented Dickey Fuller

Time series analysis uses data that is collected over time, knowing if that data series is stationary, which is important since non-stationary data could provide unreliable regression results. Therefore, to determine if the data is stationary, we used the Augmented Dickey Fuller unit root test (ADF) for four variables, (namely log of

price, log of quantity, log of income and log of real exchange rate).

Based on that, we performed the ADF test at level and we found out some of the variables are stationary therefore, we reject the null hypothesis H0 that says that we have unit root and accept the alternative hypothesis H1. However, some of the variables are non- stationary of order I (0) so, we performed the first difference unit root tests as it is presented in tables from 3.1 - 3.12 below.

Table 3.1: ADF, Unit Root Test Results for the Unit Price Variable, SITC 05

Country	Level		1st difference	
	t-Statistic (Prob.)	***Statistical Decisions***	***t-Statistic (Prob.)***	***Statistical Decisions***
France	-4.265958** (0.0009)	Stationary	–	–
Germany	-3.974504 (0.0105)	Non-Stationary	-15.97053*** (0.0000)	Stationary
Italy	-4.276958** (0.0039)	Stationary	–	–
Netherlands	-4.667937** (0.0010)	Stationary	–	–

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

According to table 3.1, the stationary time series are at level in France, Italy and the Netherlands. Therefore, for the SITC 05 price variable, we rejected the null hypothesis H0 and accepted H1. However, for Germany it is non-stationary of order I (0), so we performed the unit root at first difference and it has transformed to be stationary. Therefore, we rejected the null hypothesis H0 and accepted the alternative hypothesis H1.

Table 3.2: ADF, Unit Root Test Results for the Unit Quantity Variable, SITC 05

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
France	-5.904197*** (0.0000)	Stationary	–	–
Germany	-6.623749*** (0.0000)	Stationary	–	–
Italy	-5.904197*** (0.0000)	Stationary	–	–
Netherlands	-8.030073*** (0.0000)	Stationary	–	–

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As seen in above table 3.2, the null hypothesis at level is rejected at the 1 percent level of significance for the SITC 05 quantity variable in all countries. We concluded that our series is stationary of order I (0).

Table 3.3: ADF, Unit Root Test Results for the Unit Income Variable, SITC 05

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
France	-2.734637 (0.2235)	Non-Stationary	-5.645350*** (0.0000)	Stationary
Germany	-3.845922 (0.0156)	Non-Stationary	-5.847404*** (0.0000)	Stationary
Italy	-2.839611 (0.1844)	Non-Stationary	-5.451718*** (0.0000)	Stationary
Netherlands	-3.034366 (0.1248)	Non-Stationary	-5.255895*** (0.0001)	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As seen above in table 3.3, the test for stationary at level shows for SITC 05 income variable, in all countries have unit root, and are not stationary. Henceforth, we performed the unit root at first difference, and they transformed to be stationary at a 1 percent level of significance. Therefore, we accepted the alternative hypothesis and rejected the null hypothesis, since the income variable for all countries do not contain the unit root at first difference.

Table 3.4: ADF, Unit Root Test Results for the Unit Real Exchange Rate Variable, SITC 05

Country	Level		1st difference	
	t-Statistic (Prob.)	***Statistical Decisions***	***t-Statistic (Prob.)***	***Statistical Decisions***
France	-3.957193 (0.0111)	Non-Stationary	-14.49591*** (0.0000)	Stationary
Germany	-4.075433* (0.0076)	Stationary	–	–
Italy	-2.839611 (0.1844)	Non-Stationary	-5.377896** (0.0001)	Stationary
Netherlands	-3.845423 (0.0156)	Non-Stationary	-14.57291*** (0.0000)	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

According to table 3.4, the test for stationarity at level for SITC 05 the real exchange rate variable shows, all countries have the unit root, except Germany. So, for Germany we rejected the null hypothesis that says it has the unit root and accept the hypothesis that says no unit root. However, for the rest of the countries we performed the unit root at first difference, transformed to be stationary at a 1 percent

level of significance. So, we accepted the alternative hypothesis and rejected the null hypothesis, since the real exchange rate variable for those countries do not contain the unit root at first difference.

Table 3.5: ADF, Unit Root Test Results for the Unit Price Variable, SITC 07

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
Denmark	-2.345368 (0.4076)	Non-Stationary	-12.00794*** (0.0000)	Stationary
Finland	-6.321707*** (0.0000)	Stationary	–	–
France	-4.276958* (0.0039)	Stationary	–	–
Germany	-5.925085*** (0.0000)	Stationary	–	–
Italy	-4.479326** (0.0019)	Stationary	–	–
Netherlands	-4.246242* (0.0003)	Stationary	–	–
Sweden	-6.562805*** (0.0000)	Stationary	–	–
Spain	-4.218147* (0.0018)	Stationary	–	–
UK	-2.703528 (0.2360)	Non-Stationary	-14.54412*** (0.0000)	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As seen in table 3.5, the null hypothesis at level is rejected for the price SITC 07 variable in all countries except, Denmark and the UK. Henceforth, we performed the unit root test at first difference, and they transformed to be stationary at a 1

percent level of significance. Therefore, we accepted the alternative hypothesis and rejected the null hypothesis since the price variable for Denmark and the UK do not contain the unit root at first difference. We conclude that our series is stationary of order I (1).

Table 3.6: ADF, Unit Root Test Results for the Unit Quantity Variable, SITC 07

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
Denmark	-5.309223** (0.0001)	Stationary	–	–
Finland	-6.969147*** (0.0000)	Stationary	–	–
France	-3.106915 (0.1067)	Non-Stationary	-8.654104*** (0.0000)	Stationary
Germany	-3.848233 (0.0155)	Non-Stationary	-9.794658*** (0.0000)	Stationary
Italy	-3.120041 (0.1037)	Non-Stationary	-10.68602*** (0.0000)	Stationary
Netherlands	-5.894146*** (0.0000)	Stationary	–	–
Sweden	-4.837461** (0.0005)	Stationary	–	–
Spain	-4.377792** (0.0008)	Stationary	–	–
UK	-6.900346*** (0.0000)	Stationary	–	–

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As seen in the above table 3.6, for SITC 07 quantity variable, we rejected the null hypothesis that says it has unit root, and accepted the hypothesis that says no unit

root except for France, Germany and the Netherlands. Henceforth, we performed the unit root at first difference for the three countries, and they transformed to be stationary at a 1 percent level of significance. So, we accepted the alternative hypothesis, and rejected the null hypothesis since the quantity variable for those countries do not contain the unit root at first difference.

Table 3.7: ADF, Unit Root Test Results for the Unit Income Variable, SITC 07

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
Denmark	-2.345368 (0.4076)	Non-Stationary	-5.017352** (0.0002)	Stationary
Finland	-1.905015 (0.6490)	Non-Stationary	-5.586512*** (0.0000)	Stationary
France	-2.734637 (0.2235)	Non-Stationary	-5.645350*** (0.0000)	Stationary
Germany	-3.845922 (0.0156)	Non-Stationary	-5.847404*** (0.0000)	Stationary
Italy	-2.839611 (0.1844)	Non-Stationary	-5.451718*** (0.0000)	Stationary
Netherlands	-3.034366 (0.1248)	Non-Stationary	-5.255895** (0.0001)	Stationary
Sweden	-2.394216 (0.3817)	Non-Stationary	-4.100736* (0.0071)	Stationary
Spain	-2.800609 (0.1984)	Non-Stationary	-3.995660* (0.0099)	Stationary
UK	-3.374406 (0.0570)	Non-Stationary	-4.988901** (0.0003)	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As seen in the above table 3.7, the test for stationarity at level show for SITC 07

income variable, all countries have the unit root, and so they are not stationary. Henceforth, we performed the unit root at first difference and they transformed to be stationary. Therefore, we accepted the alternative hypothesis and rejected the null hypothesis, since the income variable for all countries do not contain unit root at first difference. We conclude that our series is stationary of order I (1).

Table 3.8: ADF, Unit Root Test Results for the Unit Real Bilateral Exchange Rate Variable, SITC 07

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
Denmark	-4.075433* (0.0076)	Stationary	-	-
Finland	-3.625828 (0.0295)	Non-Stationary	-11.95085*** (0.0000)	Stationary
France	-3.957193 (0.0111)	Non-Stationary	-14.49591*** (0.0000)	Stationary
Germany	-3.651291 (0.0274)	Non-Stationary	-14.60078*** (0.0000)	Stationary
Italy	-4.541842** (0.0015)	Stationary	-	-
Netherlands	-3..845423 (0.0156)	Non-Stationary	-14.57291*** (0.0000)	Stationary
Sweden	-3.245483 (0.0780)	Non-Stationary	-12.47237*** (0.0000)	Stationary
Spain	-4.323748** (0.0033)	Stationary	-	-
UK	-3.512052 (0.0400)	Non-Stationary	-14.30482*** (0.0000)	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

According to table 3.8, the test for stationarity at level shows for SITC 29 the real exchange rate variable, all countries have the unit root, and so they are not stationary except Denmark, Italy and Spain where they are stationary at level. As a result, we performed the unit root at first difference for countries that are non-stationary and they transformed to be stationary at 1 percent level of significance. Consequently, we accepted the alternative hypothesis and rejected the null hypothesis, since the real bilateral exchange rate variable for those countries do not contain unit root at first difference.

Table 3.9: ADF, Unit Root Test Results for the Unit Price Variable, SITC 29

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
Germany	-4.067671* (0.0018)	Stationary	–	–
Italy	-3.583190* (0.0004)	Stationary	–	–
Netherlands	-4.151912* (0.0060)	Stationary	–	–
UK	-3.196692* (0.0002)	Stationary	–	–

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As seen in table 3.9, the null hypothesis at level is rejected at 5 percent level of significance for SITC 29 price variable in all countries. We conclude that our series is stationary of order I (0).

Table 3.10: ADF, Unit Root Test Results for the Unit Quantity Variable, SITC 29

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
Germany	-2.545790 (0.3059)	Non-Stationary	-11.20268*** (0.0000)	Stationary
Italy	-5.420277** (0.0001)	Stationary	–	–
Netherlands	-3.766405* (0.0098)	Stationary	–	–
UK	-2.117081 (0.5335)	Non-Stationary	-7.002931*** (0.0000)	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As presented in above table 3.10, the null hypothesis at level is rejected for SITC 29 quantity variable for Italy and the Netherlands. However, we accepted the null hypothesis at level for Germany and the UK. Subsequently, we performed the unit root test at first difference and they transformed to be stationary at a 1 percent level of significance. Therefore, we accepted the alternative hypothesis and rejected the null hypothesis, since the quantity variable for Germany and the UK do not contain the unit root at first difference.

Table 3.11: ADF, Unit Root Test Results for the Unit Income Variable, SITC 29

Country	Level		1st difference	
	t-Statistic (Prob.)	*Statistical Decisions*	*t-Statistic (Prob.)*	*Statistical Decisions*
Germany	-3.845922 (0.0156)	Non-Stationary	-5.847404*** (0.0000)	Stationary
Italy	-2.839611 (0.1844)	Non-Stationary	-5.451718*** (0.0000)	Stationary

Netherlands	-2.999549 (0.1343)	Non-Stationary	-5.313378** (0.0001)	Stationary
UK	-3.374406 0.0570	Non-Stationary	-4.988901** (0.0003)	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

As seen in the above table 3.11, the test for stationarity at level shows for SITC 29 income variable, all countries have the unit root, and so they are not stationary. Henceforth, we performed the unit root at first difference and they transformed to be stationary. As a result, we accepted the alternative hypothesis and rejected the null hypothesis, since the income variable for all countries do not contain the unit root at first difference. We conclude that our series is stationary of order I (1).

Table 3.12: ADF Unit Root Test Results for Unit Real Bilateral Exchange Rate Variable, SITC 29

Country	**Level**		**1st difference**	
	t-Statistic (Prob.)	***Statistical Decisions***	***t-Statistic (Prob.)***	***Statistical Decisions***
Germany	-3.651291 (0.0274)	Non-Stationary	-14.60078*** (0.0000)	Stationary
Italy	-4.541842** (0.0015)	Stationary	–	–
Netherlands	-3.845423 (0.0156)	Non-Stationary	-14.57291** (0.0001)	Stationary
UK	-3..512052 (0.0400)	Non-Stationary	-14.30482*** 0.0000	Stationary

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's calculations based on estimation on Eviews

According to table 3.12, the test for stationarity at level shows for SITC 29 the real bilateral exchange rate variable, and all countries have unit root, except Germany. So, for Germany we rejected the null hypothesis that says it has unit root and accept the hypothesis that says no unit root. However, for the rest of the countries we performed the unit root at first difference and they transformed to be stationary at 1 percent level of significance. So, we accepted the alternative hypothesis and rejected the null hypothesis, since the real bilateral exchange rate variable for those countries does not contain the unit root at first difference.

In conclusion, the results in the tables showed that for some of the variables, the null hypothesis at level is rejected, order I (0). However, the rest of the variables, which failed to pass the unit root at level, passed unit root at first difference. Therefore, we rejected the null hypothesis at 1 percent level of significance for all sample countries. Thus, we conclude that our series are integrated order one I (1). This means the data is not stationary at level, it is stationary at the first differences. Therefore, the variables in the model are ready for the Bounds Testing approach.

3.3.2. Bounds Test

The Bounds test was introduced by Pesarna *et al*. (2001). The Bounds test is beneficial when it comes to allowing different lag orders for both dependent and explanatory variables in a model. Moreover, the test gets rid of the uncertainties regarding the order of integration or the unit root for each variable, to examine a long run relationship. The Bounds test can be applied for long-term relationships

among variables, regardless of whether the variables are stationary, I (0) or integrated order one, I (1). However, none of the variables could be I (2). Therefore, for the purpose of this study we applied the Bounds test for the first equation (Eq. 1), and the second equation (Eq. 2).

Table 3.13: Bounds Test Results, (Eq. 1)

Variable				
SITC- 05				
Country	$ln\frac{EQ}{KQ}$	$ln\frac{EUX}{KUX}$	***F-Statistic***	***Statistical Decisions***
France	I(0)	I(0)	-	-
Germany	I(0)	I(1)	16.64***	Cointegrated
Italy	I(0)	I(0)	-	-
Netherlands	I(0)	I(0)	-	-
SITC -07				
Denmark	I(0)	I(1)	23.80***	Cointegrated
Finland	I(0)	I(0)	-	-
France	I(1)	I(0)	4.91*	Cointegrated
Germany	I(1)	I(0)	6.84**	Cointegrated
Italy	I(1)	I(0)	11.18***	Cointegrated
Netherlands	I(0)	I(0)	-	-
Sweden	I(0)	I(0)	-	-

Spain	I(0)	I(0)	-	-
UK	I(0)	I(1)	19.74***	Cointegrated
SITC -29				
Germany	I(1)	I(0)	7.71**	Cointegrated
Italy	I(0)	I(0)	-	-
Netherlands	I(1)	I(0)	15.84***	Cointegrated
UK	I(1)	I(0)	0.95	No Cointegration

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

The Bounds test results for the unit price and the unit quantity using the first equation (Eq. 1), are presented in the above table 3.13, and the general results show that all variables have a long-term relationship except the UK for product SITC 29, which does not have a long-term relationship with unit price and unit quantity variables. Therefore, we eliminate the UK (SITC 29) variables from the model. Moreover, we applied the Bounds test for our newly added variables, unit income, and unit real bilateral exchange rate as presented in table 3.14 below.

Table 3.14: Bounds Test Results, (Eq. 2)

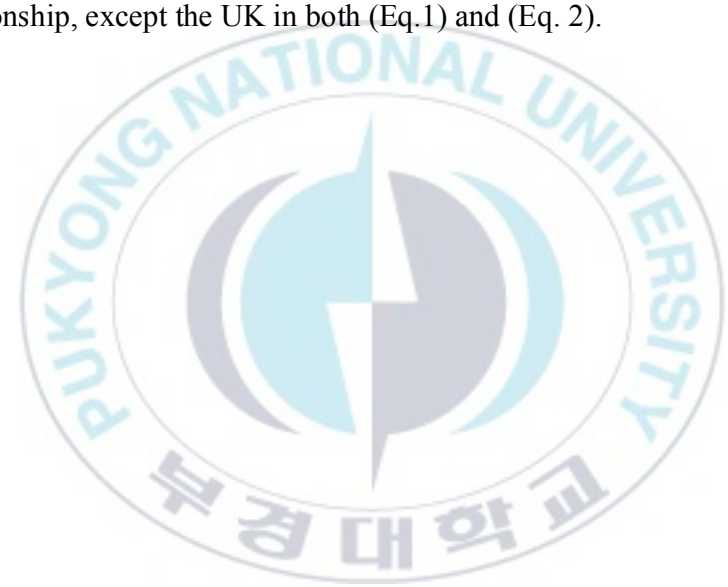
Variable						
SITC- 05						
Country	$ln\frac{EQ}{KQ}$	$ln\frac{EUX}{KUX}$	lnY	$ln\frac{EXG}{KXG}$	***F-Statistic***	***Statistical Decisions***

France	I(0)	I(0)	I(1)	I(0)	7.25***	Cointegrated
Germany	I(0)	I(1)	I(1)	I(1)	10.12***	Cointegrated
Italy	I(0)	I(0)	I(1)	I(1)	6.74***	Cointegrated
Netherlands	I(0)	I(0)	I(1)	I(1)	11.39***	Cointegrated
SITC -07						
Denmark	I(0)	I(1)	I(1)	I(0)	11.49***	Cointegrated
Finland	I(0)	I(0)	I(1)	I(1)	12.83***	Cointegrated
France	I(1)	I(0)	I(1)	I(1)	4.99**	Cointegrated
Germany	I(1)	I(0)	I(1)	I(1)	6.74***	Cointegrated
Italy	I(1)	I(0)	I(1)	I(0)	5.91*	Cointegrated
Netherlands	I(0)	I(0)	I(1)	I(1)	10.45***	Cointegrated
Sweden	I(0)	I(0)	I(1)	I(1)	9.42***	Cointegrated
Spain	I(0)	I(0)	I(1)	I(0)	8.16***	Cointegrated
UK	I(0)	I(1)	I(1)	I(1)	4.77**	Cointegrated
SITC -29						
Germany	I(1)	I(0)	I(1)	I(0)	5.85**	Cointegrated
Italy	I(0)	I(0)	I(1)	I(0)	5.31***	Cointegrated
Netherlands	I(1)	I(0)	I(1)	I(1)	7.30***	Cointegrated
UK	I(1)	I(0)	I(1)	I(1)	1.09	No Conintegration

Note: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%
Source: Author's own calculations based on estimation from the Eviews

According to the above table 3.14, the results from the Bounds test suggested that all four variables (namely, price, quantity, income and the real bilateral exchange rate) have a long run relationship for all countries except the UK.

In conclusion, out of 34 products 7 of the industries passed the ADF unit root test at level, 10 passed at first difference for (Eq.1), and for (Eq.2) all 17 products passed at first difference. Additionally, based on the Bounds test, all variables have a long-term relationship, except the UK in both (Eq.1) and (Eq. 2).



Chapter 4 - Results and Analysis

This chapter presents the estimation results and analysis, using the time series monthly data. We conducted this study based on three major commodities, SITC 05 (vegetable and fruits), SITC 07 (coffee, tea, cocoa, spices and manufactured thereof) and SITC 29 (crude animal and vegetable materials, n,e,s) at a 2- digit level. The chapter is organized into two main subsections. The first section presents the data analysis for quantity, price, income and the real bilateral exchange rate variables based on the estimation of elasticity of substitution: the simple demand model. The second section deals with the calculation of the Rivalry Threat Index (RTI) at a 4-digit level disaggregated level.

4.1. Empirical Results for Elasticity of Substitution: Simple Demand Model

As mentioned in chapter 3, we used two equations for the purpose of this research. The first equation estimated using two variables, quantity and price. The regression results for the simple demand model are presented in tables 4.1, 4.2 and 4.3 below. The estimated coefficients are presented together with the value of standard errors of the coefficient in each commodity group.

Table 4.1: Estimation Results from the Elasticities of Substitution for SITC 05, (Eq. 1)

Country	Constant	ln(EUX/KUX)	R-squared
France	-2.750*** (0.201)	-0.069 (0.168)	0.0005
Germany	-2.366*** (0.056)	-0.013 (0.097)	0.0055
Italy	-0.970*** (0.062)	-1.555*** (0.068)	0.1896
Netherlands	-2.254*** (-0.111)	-0.183** (0.095)	0.0128

Note1: The dependent variable is ln(EQ/KQ)

Note 2: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%

Note 3: Standard Error are in Parentheses.

As presented in the above table 4.1, the value of coefficients for the elasticity of substitution for SITC 05 rests in a range from -0.013 to -0.555. Based on the above estimation, the value of coefficients for Italy is -1.555, and is statistically significant at a 1 percent. This means when the price of Kenya's exports decrease by 1 percent, it gives an increase of 1.555 percent in, the quantity of export from Kenya in the Italian market. Conversely, the exports from Kenya and Ethiopia in the Netherlands showed values that are less than 1 (inelastic). In particular, the exports from Ethiopia and Kenya in the SITC 05 commodity group in the Netherlands are not substituted. The results for France and Germany showed statistically insignificant results.

Table 4.2: Estimation Results from the Elasticities of Substitution for SITC 07, (Eq. 1)

Country	Constant	ln(EUX/KUX)	R-squared
Denmark	-0.043 (0.047)	0.926*** (0.035)	0.712
Finland	-0.999*** (0.049)	-0.793*** (0.121)	0.141
France	0.623** (0.213)	-1.010*** (0.178)	0.101
Germany	0.301*** (0.067)	-2.359*** (0.288)	0.191
Italy	1.910*** (0.075)	0.290 (0.266)	0.004
Netherlands	-1.720*** (0.128)	0.062 (0.101)	0.001
Sweden	0.066*** (0.078)	-0.513* (0.312)	0.197
Spain	0.066 (0.078)	-1.691*** (0.204)	0.197
UK	-4.260*** (0.069)	1.363*** (0.157)	0.209

Note1: The dependent variable is ln(EQ/KQ)

Note 2: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%

Note 3: Standard Error are in Parentheses.

According to table 4.2, the values of the elasticity of substitution are statistically significant in 7 out of the 9 countries and they rest in a range from -0.513 to -2.359. The value of coefficients which are greater than 1 (elastic) are France (-1.010),

Germany (-2.359), Spain (-1.691), and the UK (1.363). These values imply that a decrease of export prices by 1 percent, gives an increases of 1.010 percent (France), 2.359 percent (Germany) and 1.691 percent (Spain) increase in , the quantity of exports from Kenya, and a 1.363 percent (the UK) increase the quantity of export from Ethiopia. These results indicate that a small reduction in the prices of Kenyan products in France, Germany and Spain encourages the increase in exports from Kenya significantly, respective to the exports from Ethiopia in the UK.

Table 4.3: Estimation Results from the Elasticities of Substitution for SITC 29, (Eq. 1)

Country	Constant	ln(EUX/KUX)	R-squared
Germany	-1.629*** (0.061)	0.263** (0.105)	0.021
Italy	-0.628*** (0.131)	-0.327** (0.107)	0.054
Netherlands	-1.061*** (0.142)	-0.207** (0.086)	0.020

Note1: The dependent variable is ln(EQ/KQ)

Note 2: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%

Note 3: Standard Error are in Parentheses.

As shown in table 4.3, the values of the elasticity of substitution results are statistically significant for all countries and they rest in a range from -0.207 to -0.327 at a 5 percent level of significance. However, all countries show values which are less than 1 (inelastic). As a results, the exports from Ethiopia and Kenya in the SITC 29 commodity group in the selected countries are not substituted.

Since, the above results are based on only two variables, price and quantity (eq.1) it shows the limitation in the number of expletory variables. Therefore, this study added two variables: the bilateral real exchange rate and the income of an importing country, to re-estimate the elasticity of substitution using the modified model (eq. 2) as presented below.

Table 4.4: Estimation Results from the Elasticities of Substitution for SITC 05, (Eq. 2)

Country	Constant	ln(EUX/KUX)	ln(Y)	ln(ERE/ERK)	R-squared
France	-13.663** (3.792)	0.119 (0.188)	2.358** (0.833)	0.290 (0.170)	0.0570
Germany	-5.799 (3.248)	-0.392** (0.146)	0.761 (0.697)	-0.671* (0.285)	0.0681
Italy	-2.720 (1.720)	0.107 (0.593)	0.551*** (0.068)	0.984* (0.047)	0.0376
Netherlands	35.165*** (4.696)	-0.061 (0.086)	8.134*** (1.016)	-2.216*** (0..444)	0.2398

Note1: The dependent variable is ln(EQ/KQ)

Note 2: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%

Note 3: Standard Error are in Parentheses.

Based on the modified model, the elasticity of substitution results show that the income of importing countries, and the bilateral real exchange rate have a significant impact on the exports of Ethiopia and Kenya. As seen in table 4.4, an increase of income in France and the Netherlands by 1 percent, gives an increase in quantity of exports from Ethiopia by 2.358 and 8.134, respectively. This indicates

that when the importing countries get richer, they tend to buy SITC 05 products (vegetable and fruits) from Ethiopia. Contrarily, a decrease in the bilateral real exchange rate by one percent, leads to an increase of exports from Kenya by 2.216 percent in the Netherlands.

Additionally, this study also found results that are statistically significant, but with a value of less than 1 (inelastic), for the price variable, in Germany (-0.392), for the income variable in Italy (0.551) and for the real exchange rate variable, in Germany (-0.671) and in Italy (0.984). This indicates the nonexistence of substitution between Ethiopia and Kenya in these specific variables.

Table 4.5: Estimation Results from the Elasticities of Substitution for SITC 07, (Eq.2)

Country	Constant	ln(EUX/KUX)	ln(Y)	ln(ERE/ERK)	R-squared
Denmark	-3.018 (3.125)	0.933*** (0.035)	0.623 (0.661)	0.307 (0.269)	0.7125
Finland	-3.241 (2.493)	-1.478** (0.154)	-0.656 (0.399)	0.522 (0.536)	0.1751
France	-2.031 (3.257)	-0.677*** (0.161)	0.745 (0.715)	-1.834*** (0.146)	0.4433
Germany	-14.540*** (1.296)	-1.910*** (0.185)	3.310*** (0.369)	-0.431* (0.161)	0.6765
Italy	14.581*** (6.629)	-1.385* (2.219)	-2.591*** (0.464)	-2.966*** (0.177)	0.5767
Netherlands	0.141 (7.683)	-0.184* (0.089)	-0.250 (1.664)	-3.394*** (0.731)	0.2537
Sweden	-10.091** (3.103)	-0.651** (0.226)	2.097** (0.663)	-4.931*** (0.312)	0.4931
Spain	4.179**	0.022	5.505	-1.808***	0.1521

	(1.193)	(0.004)	(0.491)	(0.341)	
UK	0.166**	0.022***	-0.001*	-0.025***	0.3452
	(0.053)	(0.004)	(0.000)	(0.004)	

Note1: The dependent variable is ln(EQ/KQ)

Note 2: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%

Note 3: Standard Error are in Parentheses.

According to table 4.5, the coefficient values rest in a range from -0.001 to 5.505. The price variable is statistically significant for all countries except Spain. Whereas, the income value is statistically significant for Germany, Italy, Sweden and the UK, and also, the value of the bilateral real exchange rate is statistically significant for all countries except Denmark and Finland. The estimation results indicate that a decrease of the price by 1 percent, gives an increase of 1.478 percent in Finland, 1.910 percent in Germany, 1.385 percent in Italy, in the quantity of exports from Kenya. Notably, a small reduction in the price of Kenyan products encourages the exports from Kenya significantly, relative to the exports from Ethiopia. On the contrary, an increase of income by 1 percent in Germany and Sweden, leads to an increase of exports by 3.310 percent and 2.097 percent from Ethiopia.

This indicates the quantity demanded is very sensitive for SITC 07 (coffee, tea, cocoa, spices and manufactured thereof) products, to a change in real income of consumers. Additionally, a decrease of the real bilateral exchange rate by one percent, leads to an increase in the quantity of exports from Kenya by 1.834 percent in France, 2.966 in Italy, 3.394 in the Netherlands, 4.931 percent in Sweden, and

1.808 percent in Spain. Nevertheless, the results also found values that are statistically significant, but with values that are less than 1 (inelastic), for the price variable, in Netherland (-0.184), in Sweden (-0.651) and in the UK (0.022) and, for the real exchange rate variable, in Germany (0.431) and in the UK (-0.025). This means that there is no substitution between Ethiopian and Kenyan products with these particular variables.

Table 4.6: Estimation Results from the Elasticities of Substitution for SITC 29, (Eq.2)

Country	Constant	ln(EUX/KUX)	ln(Y)	ln(ERE/ERK)	R-squared
Germany	-2.000 (3.024)	-2.568*** (0.128)	0.124* (0.650)	-2.035*** (0.228)	0.4057
Italy	-54.745*** (10.497)	-0.466*** (0.077)	11.563*** (2.189)	-1.967*** (0.426)	0.5792
Netherlands	-43.627*** (7.620)	-0.704*** (0.088)	9.248*** (1.646)	0.137* (0.615)	0.2986

Note1: The dependent variable is ln(EQ/KQ)

Note 2: Statistical significance is presented as (***) 1%, (**) 5%, (*) 10%

Note 3: Standard Error are in Parentheses.

As presented in table 4.6, the estimation results show that all the variables for the elasticity of substitution are statistically significant, and the coefficient values rest in a range from -0.568 to 11.563. This estimation result indicates that a decrease of the price by 1 percent, gives an increase of 2.568 percent in Germany, in the quantity of exports from Kenya. However, an increase of income in Italy by 1 percent, gives an increase of 11.563 percent in the quantity of exports from Ethiopia

and an increase of income in the Netherlands by 1 percent, gives an increase of 9.248 percent in the quantity of exports from Ethiopia. But, a decrease of the real bilateral exchange rate by one percent, leads to an increase the quantity of exports from Kenya by 2.035 percent in Germany and 1.967 percent in Italy's markets. Furthermore, the results also found values that are statistically significant, but with values that are less than 1 (inelastic), for the price variable, in Italy (-0.466) and in the Netherlands (-0.704), and for the real exchange rate in the Netherlands (0.137), this means that there is no substitution between Ethiopian and Kenyan products with these particular variables.

In general, the results indicate that Kenya has a higher competitiveness in exports against those of Ethiopia in the selected nine importing countries markets. Especially, changes in price and a lower exchange rate in Kenya, encourages the quantity of exports from Kenya. On the contrary, an increase of income in the importing countries, encourages exports from Ethiopia. Thus, when the importing countries income rises they tend to buy more products from Ethiopia. This can be explained based on the income elasticity of demand (YED), which refers to the responsiveness of demand for a certain product, to changes in consumer income. Ethiopian products have become normal goods for the importing EU countries, because based on our results, an income increase of importing countries encourages the demand for Ethiopian products.

However, when the price of Kenya's exports decreases, and the Kenya's currency rate depreciates, the importing countries tends to buy products from Kenya. The price and real exchange rate outcome are in agreement with the research that have been done by Fang *et al.,* (2006), who found that currency depreciation encourages exports, Malaysia and the Philippines.

Commodity groups of SITC 29 for the UK failed both the unit root and bounds test, we exclude it from our regression estimation. Since, the UK is one of the top 5 export destination for Ethiopia and Kenya's products, we employed the RIT index for further investigation. Therefore, we used the RTI index to measure the degree of threat that Ethiopia, and Kenya, encounter in the selected nine EU countries, at a disaggregated 4- digit level.

4.2. The Potential Export Threat: Rivalry Threat Index (RTI)

The RTI aims at calculating and analyzing the potential export threat at a disaggregate level (4-digit). We applied it to investigate the potential export threat which Ethiopia or Kenya may encounter with higher export competition against each other and to analyze export performance.

As reported in table 4.7 below, Ethiopia faces more export threat in the selected EU countries against Kenya in SITC 0541 (Potatoes, fresh or chilled (not including sweet potatoes) products in Germany, SITC 0542 (Leguminous vegetables, dried, shelled, whether or not skinned or split) products in France, Germany, the

Netherlands, Spain, Sweden and the UK. Also, in SITC 0545 (Other fresh or chilled vegetables) products in Finland, Germany, Italy, and the Netherlands, and SITC 0546 (Vegetables (uncooked or cooked by steaming or boiling in water), frozen) SITC 0548 (Vegetable products, roots and tubers, chiefly for human food, n.e.s., fresh or dried) products in Germany, the Netherlands and the UK, in product SITC 0561 (Vegetables, dried (excluding leguminous vegetables), whole, cut, sliced, broken or in powder, but not further prepared) in Germany, SITC 0577 (Edible nuts (excluding nuts chiefly used for the extraction of oil), fresh or dried, whether or not shelled or peeled) products in the Netherlands, SITC 0579 (Fruit, fresh or dried, n.e.s.) products in Finland, France, Germany, the Netherlands and the UK, and lastly in product group SITC 0599 (Juice of any single fruit (other than citrus) or vegetable; mixtures of fruit or vegetable juices) in the Netherlands markets.

Whereas, Kenya faces a higher degree of export threat against Ethiopia, in SITC 0542 (Leguminous vegetables, dried, shelled, whether or not skinned or split) products in Finland and the UK, SITC 0545 (Other fresh or chilled vegetables) products in France, SITC 0579 (Fruit, fresh or dried, n.e.s.) products in the French and German market.

Therefore, these findings show that Ethiopia faces a higher degree of export threat at a disaggregate level with SITC 05 (vegetable and fruits) products, especially in Finland, Germany, and the Netherlands from Kenya.

Table 4.7: Rivalry Threat Index (RTI) at 4-digit level of SITC 05

		RTI in Ethiopia's point of view in Finland								RTI in Kenya's point of view in Finland							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0542	Leguminous vegetables, dried,									0.0004	0.0001	0.0002	0.0001				
0545	Other fresh or chilled vegetables	0.1382	0.2678	0.0001		0.0046	0.0083	0.0045	0.0021	0.0004	0.0003			0.0010	0.0004	0.0021	0.0017
0579	Fruit, fresh or dried, n.e.s.	1.1370	4.2877	5.6934	0.8308	0.1289	0.1352	0.0323	0.0001	0.0021	0.0018	0.0023	0.0052	0.0030	0.0010	0.0036	0.0008

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.7: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 05

		RTI in Ethiopia's point of view in France								RTI in Kenya's point of view in France							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0542	Leguminous vegetables, dried,	0.0178	0.0010	0.0022	0.0003	0.0002	0.0001	0.0001	0.0001	0.0025		0.0002					
0545	Other fresh or chilled vegetables	0.0010	0.0006				0.0001	0.0001	0.0001	0.0064	0.0037	0.0003	0.0004	0.0001	0.0009	0.0011	0.0011
0579	Fruit, fresh or dried, n.e.s	0.0836	0.0001	0.0002		0.0068	0.0014	0.0070	0.0023	0.0414	0.0144	0.0064	0.0018	0.0216	0.0203	0.0408	0.0261

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.7: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 05

		RTI in Ethiopia's point of view in Germany								RTI in Kenya's point of view in Germany							
SITC	product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0541	Potatoes, fresh or chilled	2.2217	3.7056	11.457	0.0054	0.0207	0.0348	0.4299	0.7208	0.0004	0.0002	0.0003	0.0015	0.0063	0.0002	0.0086	0.0010
0542	Leguminous vegetables, dried,	0.0026	0.0027	0.0014	0.0005	0.0007	0.0003			0.0003	0.0004	0.0002		0.0001			
0545	Other fresh or chilled vegetables	0.0507	0.0513	0.0229	0.0032	0.0001	0.0004	0.0116	0.0874	0.0159	0.0158	0.0086	0.0028	0.0007	0.0017	0.0104	0.0233
0546	Vegetables frozen	0.6477	0.1201	0.8441	0.1466	0.0144	0.0022	0.0027	0.0064	0.0893	0.0172	0.1263	0.0163	0.0241	0.0013	0.0174	0.0153
0548	Vegetable products, roots	0.1861	0.0927	1.1462	0.0706	0.0094	0.0137	0.0070	0.0082	0.0101	0.0167	0.0215	0.0019	0.0083	0.0237	0.0741	0.0972
0561	Vegetables, dried (exc.)	0.0392	0.0310	0.0046	0.2055	0.0188		0.0091	0.0044	0.0012	0.0007	0.0002	0.0014	0.0007	0.0001	0.0001	0.0000
0579	Fruit, fresh or dried, n.e.s	0.1081	0.0001	0.0141	0.0119	0.0001	0.0006			0.0297	0.0144	0.0177	0.0485	0.0011	0.0067	0.0003	0.0005

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.7: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 05

		RTI in Ethiopia's point of view in Italy								RTI in Kenya's point of view in Italy							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0545	Other fresh or chilled vegetables	0.0984	0.1339	0.0581	0.0496	0.0254	0.0078	0.0073	0.0050	0.0006	0.0014	0.0002	0.0003	0.0003	0.0005	0.0000	0.0000

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.7: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 05

		RTI in Ethiopia's point of view in the Netherlands								RTI in Kenya's point of view in the Netherlands							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0542	Leguminous vegetables, dried,	0.0225	0.0080	0.0192	0.0198	0.0114	0.0086	0.0002	0.0001	0.0047	0.0005	0.0181	0.0172	0.0196	0.0134		
0545	Other fresh or chilled vegetables	5.8457	124.5366	14.7233	2.3258	0.1884	0.4649	0.2416	0.2171	0.0513	0.1074	0.1042	0.1260	0.0796	0.0382	0.1773	0.1764
0548	Vegetable products, roots	0.0010	0.0004	0.0358	0.0043	0.0016	0.0009	0.0009	0.1175	0.0052	0.0080	0.0114	0.0042	0.0022	0.0033	0.0056	0.1903
0577	Edible nuts	0.6556	0.4733	17.901	1.2418	0.2549	0.0057	0.0001		0.0167	0.0100	0.0068	0.0035	0.0029	0.0014	0.0001	
0579	Fruit, fresh or dried, n.e.s	0.0136	0.0029	0.0055	0.0008		0.0013	0.0001	0.0006	0.0023	0.0007	0.0012	0.0012	0.0004	0.0008	0.0018	0.0057
0599	Juice of any single fruit	2.2548	2.6423	3.4829	0.2228	0.1317	0.4707	0.0625	0.0410	0.0370	0.0257	0.0369	0.0262	0.0278	0.0152	0.0368	0.0263

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.7: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 05

		RTI in Ethiopia's point of view in Spain								RTI in Kenya's point of view in Spain							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0542	Leguminous vegetables, dried,	0.0014	0.0005	0.0005	0.0007	0.0004	0.0003	0.0001		0.0007	0.0002	0.0004		0.0001	0.0001		
		RTI in Ethiopia's point of view in Sweden								RTI in Kenya's point of view in Sweden							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0542	Leguminous vegetables, dried,	0.0001												0.0001			

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.7: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 05

		RTI in Ethiopia's point of view in the UK								RTI in Kenya's point of view In the UK							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0542	Leguminous vegetables, dried,	0.0030	0.0045	0.0095	0.0018	0.0030	0.0014	0.0002	0.0029	0.0265	0.0111	0.0316	0.0001	0.0006	0.0001		0.0012
0545	Other fresh or chilled vegetables						0.0001	0.0003	0.0068		0.0011	0.0011	0.0001	0.0002	0.0024	0.0048	0.0187
0548	Vegetable products, roots	0.5115	0.7539	19.8826	0.6638	0.0670	2.8385	0.4070	0.0024	0.0004	0.0014	0.3687	0.0334	0.0467	0.6149	1.6979	0.6314
0579	Fruit, fresh or dried, n.e.s	0.2044		0.0190	0.0065	0.0276	0.0286	0.0082	0.0054	0.0265	0.0036	0.0122	0.0253	0.0163	0.0395	0.0162	0.0179

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculation

As reported in table 4.8 below, both Ethiopia and Kenya are faced with export threats in the EU markets with different products. It shows that Kenya encounters a higher degree of export threat against Ethiopia. Specifically, in SITC 0711 (Coffee, not roasted, whether or not decaffeinated; coffee husks and skins) products in Denmark, Finland, Germany, the Netherlands, Spain, Sweden, and the UK, and SITC 0712 (Coffee, roasted) products in Denmark, France, and the UK also SITC 0751 (Pepper of the genus Piper; fruits of the genus Capsicum or of the genus Pimenta, dried or crushed or ground) products in Germany, the Netherlands and the UK, also, in SITC 0752 (Spices, except pepper and pimento) products in Germany and finally in the UK markets.

On the other hand, Ethiopia encounters a higher degree of export threat against Kenya in product group SITC 0711 (Coffee, not roasted, whether or not decaffeinated; coffee husks and skins) in France and Italy, in product group SITC 0712 (Coffee roasted) in Finland, Germany, the Netherlands and Sweden and in product group SITC 0714 in the UK markets.

These findings indicate that Ethiopia has less of an export threat in most of the SITC 07 (Coffee, tea, cocoa, spices and manufactured thereof) products in the selected EU countries, compared to Kenya.

Table 4.8: Rivalry Threat Index (RTI) at 4-digit level of SITC 07

		RTI in Ethiopia's point of view in Denmark								RTI in Kenya's point of view In Denmark							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.0011	0.0091	0.0042	0.0058	0.0063	0.0012	0.0014	0.0006	0.0043	0.0045	0.0076	0.0135	0.0090	0.0038	0.0062	0.0037
0712	Coffee, roasted	0.0076	0.0085	0.0137	0.2518	0.0013	0.0001	0.0074	0.0002	0.0215	0.0286	0.0777	0.0400	0.0566	0.0011	0.0048	0.0022
		RTI in Ethiopia's point of view in Finland								RTI in Kenya's point of view in Finland							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.0042	0.0076	0.0025	0.0066	0.0186	0.0076	0.0066	0.0025	0.0190	0.0306	0.0183	0.0471	0.0538	0.0626	0.0483	0.0308
0712	Coffee, roasted	0.2278	0.0155	0.0438	0.0158	0.0002	0.8379	0.0541	0.0647	0.0388	0.0032	0.1023	0.0926	0.0474	0.0781	0.0044	0.0007

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.8: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 07

		RTI in Ethiopia's point of view in France								RTI in Kenya's point of view in France							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	100.2821	51.0850	33.3373	212.0669	6.0947	116.2930	115.2458	28.6209	25.5993	58.7513	40.5465	11.0388	8.1462	1.3310	1.0497	0.4834
0712	Coffee, roasted	0.0094	0.9483	1.1429	9.9411	0.4620	8.5076	0.0008	0.4345	0.0626	0.2988	0.7577	0.1320	1.6762	0.4293		0.0051

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.8: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 07

		RTI in Ethiopia's point of view in Germany								RTI in Kenya's point of view in Germany							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.3844	0.3547	0.2563	0.2066	0.3011	0.1125	0.0851	0.0625	0.3714	0.4300	0.3874	0.2666	0.1565	0.0887	0.0767	0.0779
0712	Coffee, roasted	0.1570	0.0425	0.0318	0.3058	0.0095	0.4946	0.1096	0.1667	0.0150	0.0148	0.0188	0.0574	0.1232	0.0514	0.0006	0.0352
0751	Pepper of the genus Piper;	0.0343	0.0008	0.0028	0.0017	0.0003	0.0335	0.0063	0.0054	0.0817	0.1788	0.1003	0.0076	0.0114	0.0554	0.0832	0.1772
0752	Spices (except pepper and pimento)	0.0172	0.0093	0.0026	0.0004	0.0001		0.0001	0.0069		0.0173	0.0007	0.0001	0.0020	0.0005	0.0019	0.0063
		RTI in Ethiopia's point of view in Italy								RTI in Kenya's point of view in Italy							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.0378	0.0358	0.0209	0.0120	0.0187	0.0097	0.0036	0.0035	0.0246	0.0304	0.0077	0.0029	0.0020	0.0027	0.0005	0.0006

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.8: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 07

		RTI in Ethiopia's point of view in the Netherlands								RTI in Kenya's point of view in the Netherlands							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.0001	0.0038	0.0047	0.0075	0.0129	0.0041	0.0047	0.0056	0.0021	0.0168	0.0350	0.0423	0.0406	0.0080	0.0138	0.0252
0712	Coffee, roasted	0.0718	0.0097	0.0446	0.4721	0.0006	0.0144	0.0233	0.0106	0.0025	0.0009	0.0594	0.2190	0.0517	0.0098	0.0023	
0751	Pepper of the genus Piper;	0.4257	0.0050	0.0054	0.0022	0.0011	0.0008		0.0015	0.1236	0.0462	0.0338	0.0100	0.0581	0.0670	0.0505	0.0255
0752	Spices (except pepper and pimento)	0.1257	0.0095	0.0047	0.0009	0.0014	0.0013	0.0050		0.0079	0.0042	0.0007	0.0002	0.0034	0.0096	0.0555	0.0071

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.8: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 07

		RTI in Ethiopia's point of view in Spain								RTI in Kenya's point of view in Spain							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.0023	0.0086	0.0040	0.0050	0.0122	0.0044	0.0039	0.0044	0.0093	0.0209	0.0138	0.0153	0.0073	0.0039	0.0032	0.0085
		RTI in Ethiopia's point of view in Sweden								RTI in Kenya's point of view in Sweden							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.0001	0.0010	0.0004	0.0120	0.0666	0.0258	0.0344	0.0147	0.0045	0.0162	0.0081	0.0765	0.1221	0.1257	0.1657	0.0854
0712	Coffee, roasted	0.0089	0.0044	0.0071	0.1348	0.0028	0.0664	0.0632	0.0131	0.0001	0.1690	0.5023	0.2222	0.0156	0.0082	0.0019	0.0006

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.8: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 07

		RTI in Ethiopia's point of view in the UK								RTI in Kenya's point of view in the UK							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
0711	Coffee, not roasted,	0.0005	0.0006	0.0014	0.0053	0.0227	0.0206	0.0197	0.0136	0.0090	0.0123	0.0198	0.0462	0.0478	0.0699	0.0413	0.0179
0712	Coffee, roasted	0.0029	0.0011	0.0017	0.0132	0.0005	0.0358	0.1552	0.0246	0.0065	0.0144	0.0541	0.0431	0.0232	0.0007	0.0090	0.0010
0741	Tea, whether or not flavored	0.0067	0.0003	0.0009	0.0027	0.0001		0.0001	0.0001	0.0011	0.0006	0.0003	0.0028	0.0002	0.0001	0.0002	0.0003
0751	Pepper of the genus Piper;	0.9023	0.0077	0.0120	0.0005	0.0002	0.0007	0.0054	0.0047	0.6906	0.1624	0.5060	0.0627	0.0077	0.0109	0.0358	0.0421
0752	Spices (except pepper and pimento)	0.0573	0.0055	0.0025	0.0011	0.0023		0.0001	0.0005	0.0196	0.0591	0.0117	0.0001	0.0122	0.0021	0.0124	0.0208

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

According to the findings in table 4.9 below, both Ethiopia and Kenya encounter a high export threat to the selected EU countries. Ethiopia faces higher threats in exports from Kenya in most of the selected EU countries, in the following products: SITC 2911 (Bones, horns, ivory, hooves, claws, coral, shells and similar products) in France, Germany, Spain and Sweden, SITC 2919 (Materials of animal origin, n.e.s.) in the UK, SITC 2926 (Bulbs, tubers and rhizomes of flowering or of foliage plants; cuttings, slips, live trees and other plants) in France, Germany, Italy, in the Netherland, Spain, Sweden and the UK, SITC 2927 (Cut flowers and foliage) products in Italy, Spain, Sweden and the UK, SITC 2929 (Materials of vegetable origin, n.e. s) in the UK.

On the contrary, Kenya encounters a higher degree of export threat against Ethiopia in SITC 2922 (Lac; natural gums, resins, gum resins, and balsams) products in Germany, Italy, Spain and the UK, and in SITC 2927 (Cut flower and foliage) products in Germany, and the Netherlands.

These findings indicate that the export threat in the selected EU countries is higher from an Ethiopian point of view.

Table 4.9: Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in Finland								RTI in Kenya's point of view in Finland							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2927	Cut flowers and foliage					0.0004	0.0003		0.0001						0.0001	0.0001	0.0010

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.9: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in France								RTI in Kenya's point of view in France							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2911	Bones, horns, ivory, hooves, claws, coral, shells	0.0013	0.0017	0.0199	0.0055	0.0143	0.0114	0.0134	0.0099	0.0008	0.0028	0.0010	0.0055	0.0027	0.0017	0.0014	0.0011
2923	Vegetable materials of a kind used primarily for plaiting	0.1153	0.0276	0.0099	0.0040	0.0080	0.0273	0.0083	0.0157	0.0958	0.0193	0.0171	0.0118	0.0273	0.0770	0.0851	0.0940
2926	Bulbs, tubers and rhizomes of flowering	9.3585	6.1062	0.3707	0.0943	0.0230	0.0281	0.0070	0.0015	0.0191	0.0181	0.0097	0.0028	0.0188	0.0154	0.0013	0.0047
2927	Cut flowers and foliage	0.0003	0.0005	0.0004			0.0003	0.0003	0.0042	0.0044	0.0003	0.0002	0.0001	0.0001	0.0019	0.0021	0.0063

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.9: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in Germany								RTI in Kenya's point of view in Germany							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2911	Bones, horns, ivory, hooves, claws, coral, shells	0.1249	0.0534	0.0396	0.0169	0.0662	0.1445	0.0350	0.0011	0.0004	0.0012	0.0024	0.0034	0.0025	0.0081	0.0008	
2922	Lac; natural gums, and balsams	0.2608	0.1183	0.0676	0.0452	0.0475	0.0377	0.0372	0.0813	0.2618	0.3031	0.1371	0.1339	0.0893	0.0916	0.1427	0.4683
2924	Plants and parts of plants	0.3353	0.0223	0.0481	0.8461	0.2045	0.0029	0.0076	0.1619	0.0788	0.0093	0.0033	0.0010	0.0306	0.0136	0.0032	0.0090
2926	Bulbs, tubers and rhizomes of flowering	14.3677	0.0351	0.0153	0.0004	0.3189	0.2152	0.0767	0.0626	0.0248	0.0019	0.0041	0.0004	0.1711	0.1384	0.0876	0.0808
2927	Cut flowers and foliage	0.0007	0.0081	0.1487	0.6185	0.0480	0.0138	0.0036	0.0027	0.0027	0.0027	0.0078	0.0293	0.0226	0.0198	0.0139	0.0147

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.9: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in Italy								RTI in Kenya's point of view in Italy							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2922	Lac; natural gums, and balsams	0.0031	0.0023	0.0015	0.0009	0.0005	0.0002	0.0002	0.0002	0.0424	0.0421	0.0530	0.0422	0.0182	0.0127	0.0123	0.0102
2926	Bulbs, tubers and rhizomes of flowering	103.7883	56.3087	3.6847	0.5901	0.0244	0.0695	0.0311	0.0150	0.0308	0.0083	0.0198	0.0064	0.0176	0.0366	0.0348	0.0300
2927	Cut flowers and foliage	0.0001	0.0001	0.0001	0.0025	0.0023	0.0004	0.0006	0.0007	0.0001	0.0001	0.0001	0.0004	0.0006	0.0004	0.0001	0.0001

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.9: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in the Netherlands								RTI in Kenya's point of view in the Netherlands							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2924	Plants and parts of plants	0.2506	0.1943	0.0874	0.0395	0.0461	0.0277	0.0795	0.0054	0.0049	0.0402	0.0622	0.0639	0.5056	0.2812	0.0818	0.0363
2925	Seeds, fruit and spores,	0.0549	0.0084	0.0001	0.0016	0.0033			0.0006	0.0075	0.0067	0.0039	0.0065	0.0113	0.0015		0.0033
2926	Bulbs, tubers and rhizomes of flowering	561.0075	163.7143	6.1351	1.6044	0.0484	0.1329	0.0977	0.0744	0.1450	0.1944	0.1146	0.0328	0.0971	0.2085	0.2507	0.2400
2927	Cut flowers and foliage	0.0249	0.0033	0.0004	0.0019	0.1241	0.2173	0.0433	0.1673	0.0247	0.0041	0.0012	0.0054	0.1387	0.2627	0.1466	0.2676

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.9: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in Spain								RTI in Kenya's point of view in Spain							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2911	Bones, horns, ivory, hooves, claws, coral, shells	0.0907	0.0201	0.0061	0.0020	0.0024	0.0003	0.0005	0.0002	0.0044	0.0076	0.0125	0.0311	0.0201	0.0071	0.0072	0.0082
2922	Lac; natural gums, and balsams	0.0001	0.0024	0.0019	0.0014	0.0028	0.0041	0.0040	0.0050	0.0020	0.0203	0.0180	0.0016	0.0033	0.0190	0.0173	0.0034
2926	Bulbs, tubers and rhizomes of flowering	1.6635	0.7501	0.0248	0.0024	0.0012	0.0003	0.0017	0.0048	0.0001	0.0013	0.0008	0.0002	0.0022	0.0016	0.0026	0.0099
2927	Cut flowers and foliage	0.0001	0.0039	0.0062	0.0010	0.0001					0.0001	0.0001	0.0001	0.0001			

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.9: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in Sweden								RTI in Kenya's point of view in Sweden							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2926	Bulbs, tubers and rhizomes of flowering	1.1517	197.2795	17.1322	5.4785	0.0391	0.0238		0.0031	0.0044	0.0083	0.0027	0.0002	0.0033	0.0039		0.0002
2927	Cut flowers and foliage	0.0015	1.2816	0.9930	0.1135	0.0120	0.0037		0.0004	0.0004	0.0005	0.0002		0.0005	0.0005		

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculations

Table 4.9: (Cont.) Rivalry Threat Index (RTI) at 4-digit level of SITC 29

		RTI in Ethiopia's point of view in the UK								RTI in Kenya's point of view in the UK							
SITC	Product	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016	1993 - 1995	1996 - 1998	1999 - 2001	2002 - 2004	2005 - 2007	2008 - 2010	2011 - 2013	2014 - 2016
2919	Materials of animal origin, n.e.s.	0.1948	0.0414	0.1503	0.0728	0.0039	0.0058	0.0046	0.0044	0.0040	0.0267	0.0150	0.0156	0.0002	0.0005	0.0003	0.0014
2922	Lac; natural gums, and balsams	0.0963	0.0003	0.0010	0.0005	0.0002	0.0002	0.0004	0.0002	0.0921	0.0237	0.0257	0.0218	0.0094	0.0061	0.0035	0.0005
2924	Plants and parts of plants	0.1481	0.1144	0.7260	1.2777	0.0725	0.0721	0.1629	0.0765	0.0263	0.0333	0.0316	0.0083	0.0087	0.3501	0.1296	0.1301
2926	Bulbs, tubers and rhizomes of flowering	208.82	98.787	15.030	0.3213	0.0011		0.0010	0.0010	0.1470	0.1013	0.0224	0.0044	0.0035	0.0022	0.0038	0.0039
2927	Cut flowers and foliage	7.2718	0.2067		0.0001	0.0007	0.0002		0.0009	0.1204	0.0165	0.0002	0.0007	0.0074	0.0039	0.0027	0.0110
2929	Materials of vegetable origin, n.e.s.	0.0829	0.0213	0.0030	0.0005	0.0012	0.0047	0.0916	2.3220	0.0140	0.0175	0.0233	0.0212	0.0201	0.0029	0.0009	0.0016

Note: Only the industries with a value of RTI greater than 0.0001 are reported.

Source: Author's own calculation

Chapter 5- Conclusions and Recommendations

5.1. Conclusions

To conclude, most developing countries face difficulties competing in the international market, due to an excessive dependence on exports from a few primary products. The lack of a decent level of competition leads a country's exports to decline, especially for countries such as Ethiopia and Kenya. Therefore, knowing which exact products Ethiopia and Kenya are losing markets in the EU and to show to what degree they are losing or gaining from those specific products, is important to be able to see the level of their export performance in the selected nine EU counties.

Thus, this research investigates whether Ethiopian or Kenyan exports outperformed each other in the nine European markets, by measuring competition between the exports of both countries, from the years 1993 to 2016. The first part of the research used the estimation of elasticity of substitution: simple demand model on commodity groups SITC 05, SITC 07 and SITC 29 at a 2-digit level on export quantity, price, income and the bilateral real exchange rate variables. The research performed the unit root test, and the results showd that the variables in only 8 out of 32 products are stationary at first level I (0). The rest are stationery at first difference I (1). However, the coefficient which was obtained from the estimation of first different regression is not meaningful from an economic point of view.

Therefore, we performed the bounds test, the results indicate the existence of a long run relationship among the variables except, with SITC 29 products in the UK. Hence, we excluded SITC 29 for the UK, from our regression estimation. The results from the value of elasticity of substitution: simple demand model suggests that Kenya had a higher competitiveness in most of the exports, against those of Ethiopia.

As can be seen in table 5.1 that presents, SITC 05 (vegetable and fruits) export products from Kenya have a higher competitiveness against Ethiopia, in the markets of France, Germany, and the Netherlands. Moreover, in SITC 07 (coffee, tea, cocoa, spices and manufactured thereof) products Kenya still has a higher competitiveness in exports against Ethiopia, in the markets of Finland, France, Germany, Italy, the Netherlands, Sweden, and the UK. While Ethiopia only has a higher competitiveness in Denmark and Spain. Lastly, SITC 29, (crude animal and vegetable materials) products Kenya has a higher competitiveness in exports against Ethiopia in the markets of Germany, Italy, the Netherlands and the UK. The coefficients of income show that an increases in income in France and Italy encourages exports from Ethiopia in STIC 05 products. Additionally, an increase of income in Germany and Sweden encourages demand in SITC of products, as an income increase in Italy and the Netherlands also does with SITC 29 products.

However, using only a 2-digit level, limited our research for precise analyzing. Since, SITC 29 products for the UK could not be estimated through the elasticity of substitution, we used the Rivalry Threat Index (RTI) at disaggregated 4- digit level in order to measure the degree of threat that Ethiopia, or Kenya, may encounter in the selected nine EU countries.

Therefore, the second part of the research used, the RTI index on commodities SITC 0541, SITC 0542, SITC 0545, SITC 0546, SITC 0548, SITC 0561, SITC 0577, SITC 0579, SITC 0599, SITC 0711, SITC 0712, SITC 0741, SITC 0751, SITC 0752, SITC 2911, SITC 2919, SITC 2926, SITC 2927 and SITC 2929 at a 4-digit level. The results from the RTI calculation showed that Kenya still encounters a higher degree of export threat against exports from Ethiopia. In other words, even if Kenya held a higher competitiveness against Ethiopia's exports at the 2- digit level, it still faces a threat from Ethiopia according to the RTI at 4-digit level. As it can be seen in table 5.2 that follows, Kenya encounters a higher export threat against exports from Ethiopia, in SITC 0545 (Other fresh or chilled vegetables) and SITC 0579 (Fruit, fresh or dried, n.e.s.) products in the markets of France and the UK, with SITC 0546 (Vegetables (uncooked or cooked by steaming or boiling in water), frozen) products in the German market, and finally in SITC 0548 (Vegetable products, roots and tubers, chiefly for human food, n.e.s., fresh or dried) products in the Netherlands.

Kenya also faces threats in SITC 0711 (Coffee, not roasted, whether or not decaffeinated; coffee husks and skins) products in the markets of Denmark, Finland, the Netherland and the UK, in SITC 0751 and in Germany from (Pepper of the genus Piper; fruits of the genus Capsicum or of the genus Pimenta, dried or crushed or ground) and in SITC 0552 (Spices, except pepper and pimento) products.

It also has threats in SITC 2911(Bones, horns, ivory, hooves, claws, coral, shells and similar products), products in the markets of Finland, Germany and Spain, SITC 2922 (Lac; natural gums, resins, gum resins, and balsams) products in Italy, in SITC 2926 (Bulbs, tubers and rhizomes of flowering or of foliage plants; cuttings, slips, live trees and other plants) products in Finnish and German markets and lastly in SITC 2927 (Cut flower and foliage) products in the UK.

Although the results from the estimation of elasticity of substitution suggested that Kenya has a higher competitiveness in almost all products against exports from Ethiopia in the selected countries, the RTI suggested more specifically which products have a higher export competitiveness from Kenya's point of view as it used a more precise 4- digit level. Based on the findings of our research the price elasticity of exports are substantially high, which means a small decrease in the price of Kenya's exports, encourages importing countries to buy much more from them. Therefore, Ethiopia loses its export competitiveness in certain groups of products from Kenyan exports.

Since, the EU is the most important and significant destination for Ethiopia and Kenya, and the fact that these two countries export identical products, a price change at any point will have a huge effect on their exports. Moreover, the findings show that a change in the real income of consumers (in the selected EU countries) have had a significant impact on exports from Ethiopia. These results have led to the development of a series of proposals outlined in the policy recommendation section below.

Table 5.1. Summary of Empirical Results from the Elasticities of Substitution Estimation: (Eq.1) and (Eq.2)

Country	***SITC(2digit)***	***Ethiopia***		***Kenya***	
		Eq.1	***Eq.2***	***Eq.1***	***Eq.2***
Denmark	*05*	-	-	-	-
	07	E	E		
	29	-	-	-	-
Finland	*05*	-	-	-	-
	07			K	K
	29	-	-	-	-
France	*05*	-	E	-	
	07			K	K
	29	-	-	-	-
Germany	*05*			K	K
	07			K	K
	29	E			K
Italy	*05*			K	K
	07	-		-	K
	29			K	K
Netherlands	*05*				K
	07				K
	29		E	K	
Sweden	*05*	-	-	-	-
	07			K	K
	29	-	-	-	-

Spain	*05*	-	-	-	-
	07				K
	29	-	-	-	-
UK	*05*		-		-
	07	E			E
	29	-	-	-	-

Note 1: (E) = Ethiopia has a higher export competitiveness against Kenya.

Note 2: (K) = Kenya has a higher export competitiveness against Ethiopia.

Note 3: (-) = Significant competition is not found.

Table 5.2: Summary of Findings from the RTI (Eq.3)

Country	***SITC(4-digit)***	***Ethiopia***	***Kenya***
Denmark	*05*	-	-
	07	0712	0711
	29		
Finland	*05*	0545,0579	
	07	0712	0711
	29	2923, 2927	2911,2926
France	*05*	0542	0545,0579
	07	0711,0712	
	29	-	-
Germany	*05*	0541,0542,0545,0548, 0561	0546
	07	0712,0752	0711,0751
	29	2922,2927	2911,2924,2926
Italy	*05*	0545	
	07	0711	
	29	2926,2927	2922
Netherlands	*05*	0542,0545,0577,0579,0599	0548
	07	0712,0752	0711,0751
	29	2924,2925,2926,2927	
Spain	*05*	0542	
	07	-	-
	29	2926,2927	2911,2922
	05	-	-
	07	0712	0711

Sweden	*29*	2926,2927	
UK	*05*	0542,0548	0545,0579
	07	0712,0741,0751	0711,0752
	29	2919,2924,2926,2929	2922,2927

Note 1: (Ethiopia) = Ethiopia encounters higher export competition from Kenya.

Note 2: (Kenya) = Kenya encounters higher export competition from Ethiopia.

Note 3: (-) = Significant competition is not found.

5.2. Policy Recommendations

Based on the conclusions made previously, this research gives significant implications for both Ethiopia and Kenya. Ethiopia especially needs to improve its level of competitiveness and efficiency in exports, to compete against Kenya in the selected EU countries. Moreover, the diversification of the primary products of both countries would be beneficial for both, by expanding their products towards more advanced and processed products, instead of just relying on raw agricultural products. This would help the country gain strength in their international competitiveness, and lead to sustainable economic growth.

Although, Kenya has a higher degree of export competiveness against exports from Ethiopia, the total amount of exports is still very low compared to other countries who also export to the EU. Therefore, the Kenyan government should emphasize and support the exportation of products that do not hold a significant level of export competitiveness. Contrarily, the government of Ethiopia should increase its focus on improving the overall strategy for its exports, especially in SITC 07 (coffee, tea

cocoa, spices and manufactured thereof) products since it's the sector in which it has high comparative advantage. Based on our results there is a potential market for Ethiopian exports in the EU, when their income increases they tend to buy from Ethiopia. Finally, there is a need for both countries to expand their trade towards other nearby emerging African markets.

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