INDIRA GANDHI NATIONAL OPEN UNIVERSITY

SCHOOL OF SOCIAL SCIENCES

DISPLINE OF ECONOMICS

Trade Effects of Regional Trade Agreements on Export Volume of Member Countries: The Case of COMESA

BY

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ADDIS ABABA

MAY 2014

Programme Code: MEC

Course Code: MECP-001

Enrolment No: 0 9 9 1 2 1 1 7 6

Study Centre Code: 8 1 0 5

Regional Centre: Ethiopia

Title: ***Trade Effects of Regional Trade Agreements on Export Volume of Member Countries: The Case of COMESA***

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ABSTRACT

This study uses a gravity model to estimate the trade effects of COMESA on its member countries. The analysis is based on bilateral export data for 19 sample countries from both the bloc and outside the bloc. The study covers the period 2000-2012. The results suggest that COMESA has a significant trade effects on its member countries. The result suggests fully integration and functioning of COMESA so that to achieved its priorities.

Keywords: Regional Integration, Trade Effects, Customs Union, Free Trade Area, Gravity Model, COMESA

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ACKNOWLEDGEMNET

I would like to express my heartfelt thanks and gratitude to my advisor Dr.Negussie Semie for his invaluable guidance, endless encouragement and valuable comments.

I have also special thanks to Gebreyesus G/Medin for his invaluable support in guiding about data analysing software (STATA).

Finally, I indebted to my family and friends for their support, advice and comments during preparing this document.

ACRONYMS

ACPP	Africa, Caribbean and Pacific Pact
AfDB	African Development Bank
COMESA	Common Market for Eastern and South Africa
CU	Customs Union
CUSFTA	Canada United States Free Trade Agreement
DoTs	Direction of Trade Statistics
EAC	East African Community
ECOWAS	Economic community of West African states
EEA	European Economic Area
EFTA	European Free Trade Association
FE	Fixed Effects
FTA	Free Trade Area
GLS	Generalised Least Squares
LDCs	Least Developed Countries
NAFTA	North American Free Trade Area
OECD	Organization for Economic Co-operation and Development
OLS	Ordinary Least Squares
PTA	Preferential Trade Area
RE	Random Effects
RoW	Rest of the World
RTA	Regional Trade Agreement
SACU	South African Customs Union
SADC	South African Development Community
SAFTA	South Asia Free Trade Area
SSA	Sub-Saharan Africa
UNCTAD	United Nations Conference for Trade and Development
UNECA	United Nations Economic Commission for Africa
WDI	World Development Indicators

CHAPTER ONE

INTRODUCTION

1.1. Background

Regional integration in Africa is not a new phenomenon. Regional economic agreements in Africa have a long history with establishment of the South African Customs Union (SACU) in 1910 and the East African Community (EAC) in 1919. Specially, since 1970s a number of regional economic agreements have been formed across the continent (Haile and Alemayehu, 2002). As the same source, today there is no country in Africa that is not a member of at least one regional economic group. As reflected in the number of regional agreements in the world-wide, the issue continues to occupy a center-stage in the economic agenda of countries.

The underlying rationale for regional integration schemes arises from international trade theories that state free trade is superior to trade discrimination among trading partners. The free trade leads to expansion of trade among trading partners which in turn enhances economic growth (Eden, 2008). According to Oyejide (2000), regional integration is a possible way of driving economies of scale through expansion of trade and economic growth. It is also viewed as a means of encouraging trade between trading partners.

From the regional agreements, COMESA[1] is one of the regional trade agreements in the continent, Africa. Its history began in December 1994 when it was formed to replace the former preferential trade area (PTA) which had existed from the earlier days of 1981. However, it came into effect as of 30th September 1982. It has mainly targeted to access a larger market size, to share the region's common heritage and destiny, to encourage greater social and economic co-operation and to create economic community (Mussie, 2011).

[1] *COMESA member countries(as October 2012) are Burundi, Comoros, Democratic Republic of Congo(DRC), Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Swaziland, Sudan, Uganda, Zambia, Zimbabwe*.

The growth of regional trade blocs has been a major development in international relations with almost every country belonging to one or multiple blocs (Schiff & Winters, 2003). Most of these blocs including COMESA have a goal of lowering barriers to trade between members. Theoretically, the lowering of trade barriers by members may lead to greater competition and open up larger markets for producers in member countries.

A well crafted trade bloc can increase competition in domestic industries and spur productive efficiency gains. This in turn can improve the quality and quantity of inputs and goods available to the economy (Dollar, 1992) as cited in Ng'ang'a (2006).The greater market size created through the regional trade agreement (RTA) expands opportunities for exports and employment growth. RTA was also considered to enhance intra-bloc trade by diverting trade away from non-member countries.

However, intra-COMESA trade remained very low. Over the last two decades the share of intra-COMESA trade was about 5-7% though the recent reports have shown some progress. For example, intra-COMESA trade grew by 10% and 9-10% in 2004 and 2005 respectively (Eden, 2008). As Korinek and Melatos (2009), trade within COMESA was low (accounts for only 7%) of total trade of the region.

In addition, a recent trade flow analysis identified some commodity groups that COMESA members export in large volumes to non-member countries and also imported in large volumes from the non-members which mainly is due to lack of knowledge about COMESA market(COMESA, 2007). These facts indicate that there is a low intra-COMESA trade experience though it has possibility and potential to increase the intra-COMESA trade which can have either trade creating or diverting effects.

In general, the trade effects of COMESA such as trade creation and/or trade diversion on its members and non-members was the basis for this study. It meant that the effects of the agreement would eventually depend on its ability to promote intra-COMESA trade. Thus, the main agenda of this study was the investigation of whether COMESA has increased intra-COMESA trade (i.e. trade creation). Equally important was whether such an arrangement has a trade diversion effect from non-member countries.

1.2. Statement of the Problem

The main motives for developing countries to enter into RTAs are to improve market access, increase the gains from trade, to develop political unity, and to achieve additional trade or economic goals (OECD, 1993). The small markets of Sub-Saharan Africa (SSA) are a large constraint for the integration of the continent into the global markets. Regional integration can diversify the economies and thus make them less vulnerable to external shocks by widening the trade and investment environment and by protecting the local industry (UNECA, 2004). Thus, it strengthens the trading environment and is seen as a necessity for long-run economic growth.

With the view of its political and economic backwardness, the significance of regional integration in Africa is very crucial issue (Mengesha, 2009). According to the author, the continent, Africa, has been facing the challenges of poverty, minimal world trade share, and low pace of development in human capital and infrastructure. In this background ensuring effective regional economic integration in Africa is one of the critical issues. This is because a successful regional economic integration may have an advantage in enhancing economic development and growth through expansion of intra-bloc trade.

However, progress in African regional integration has been slow despite the efforts and initiatives taken in promoting the arrangements and also their proliferation in the continent. Several studies (for example, Lyakurawn et al. (1997), Elbadawi (1997), Haile and Alemayehu (2002) and Gupta and Yang (2005) have been undertaken to assess the performance of regional integration in Africa. They found that these regional integration schemes were ineffective in achieving their main objective which is promoting intra-regional trade. Though the literatures in the above studies told that regional trade agreements could enhance trade among its members, the agreements in Africa have experienced low intra-regional trade condition.

According to Umurungi (2005), though there were efforts in reducing trade barriers and deepening the integration among member countries, the intra-regional trade under COMESA remained insignificant by comparing with other trade blocs. In addition, according to Fikadu (2012), due to many problems trade integration scheme in COMESA is not successful. As the authors suggest the progress in trade flows among member countries in Africa in general and COMESA in particular is an empirical issue. These issues provoked the researcher to undertake the study on trade effects of COMESA regional trade agreement.

On the other hand, many previous empirical studies have employed different methodology to assess the trade effects of regional integration. For example, Bergtrand (1985) and Eden (2008) used cross- sectional data to estimate the applied gravity models. Others have carried out their analysis using panel data. However, the results of these studies were mixed. Due to a number of obstacles, authors could not reach into consensus on the effects of preferential trade agreements (Clausing, 2001).

In addition, based on the evidence from Buigut (2012) those studies which have centred on assessing trade effects of COMESA were mainly limited to the period under PTA and the period before 2000. Only few studies have been undertaken to assess the effects of COMESA membership on trade including its later time period. According to the level of knowledge of the researcher, no studies have rigorously investigated the effects of COMESA trade agreement on trade flows focusing on its later period. Thus, the current study captured the time period from 2000-2012 and assess effects of regional trade agreement (i.e. COMESA) on trade among member countries. To this end, the study relied on a gravity model using the panel data analysis.

1.3. Objectives of the Study

1.3.1. General Objective

The general objective of this study was to assess the effects of COMESA trade agreement on intra-regional trade within the member countries.

1.3.2. Specific Objectives

The specific objectives of the study were to:

1. Assess the trade performance in COMESA region through descriptive analysis and
2. Investigate the effects of COMESA trade agreement on its intra-regional trade.

1.4. Significance of the Study

The study mainly focused on assessing the trade effects of free trade agreement with special focus on intra-COMESA trade bloc. Through this the study has come with some inputs on addressing the research objectives. It has also provided some important inputs for existing literatures. In addition, it was assumed that the study would be used as a reference for other researchers for further study on the topic and may provide some arguments on the findings of the other studies. Furthermore, the findings from applied gravity model might have some benefits for policy makers of member countries.

1.5. Scope and Limitations of the Study

It is obvious that the issue of regional integration in the world is cumbersome and wider. The term regional integration is all about political, economic, social and institutional aspects of member countries. To address all these aspects this study has faced difficulty in getting proper data. In addition, the issues needed easy data accessibility and enough time.

Therefore, this study could not include all member countries under COMESA. Because of the same problem some variables were not included in the gravity model. Moreover, this study mostly used data from electronic sources. However, to take edge off such methodological biases which might happen in the study, the researcher assessed more web sites for empirical and secondary data during the journey of the study.

1.6. Organization of the Study

Including the current chapter this study was segmented into five chapters. The current chapter is all about introduction and background of the study, problem statement, objectives, significance, scope and limitations of the study. The review of related literature was addressed in chapter two. This was followed by research methodology in chapter three. Chapter four presented some descriptive and model estimation results and discussion of the study. The last chapter came with conclusions and policy implications.

CHAPER TWO

LITERATURE REVIEW

2.1. Theoretical Literature

2.1.1. Concepts and Definitions of Regional Integration

The term 'Integration', literally means to bring parts of an object into a complete whole, while in economic terms, in narrowest sense, it means the coordination of economic activities within a nation for the purpose of improving the development of that particular nation (Mutharika, 1972). The author further gives the term a wider meaning, and indicates that it implies the process of integration of various economies in a given area or region into a single unit for the purpose of regional economic development.

Regional integration, or 'regionalism' is "any policy designed to reduce trade barriers between a subset of countries regardless of whether those countries are actually neighboring or even close to each other" (Winter ,1996). According to Rathumbu (2008) regional integration agreements are entered into by two or more countries though the countries are not belonging to the same geographical region. It is a process in which states enter into a regional agreement to enhance regional cooperation through regional institutions and rules. The goals of the agreement can range from economic to political and environmental.

As economists have defined the term 'economic integration' is a process of eliminating restrictions on international trade, payments and factor mobility (Carbaugh, 2004). In this case it results in the uniting of two or more national economies in regional trading agreements. According to Biswaro (2003), regional economic integration involves the process of trade, economic and financial convergence of integrating states.

According to Ginkel et al. (2003), regional integration refers to the process by which states within a particular region increase their level of interaction with regard to economic, security, political, and socio- cultural issues.

2.1.2. Forms for Regional Integration Agreements

Economic groupings that represent varying degrees of integration have been prevalent for a long time. The term regional integration has many forms. The forms of regional integration are as varied as the countries that pursue them. According to OECD (1993) the most common forms of regional integration include:

I. ***Preferential Trade Area (PTA):-*** is an area where preferential treatment is given to access certain products from certain countries. Tariffs and other barriers to trade are reduced among members, but not completely abolished. This is the weakest integration form. Examples: European Union (EU) and Africa, Caribbean and Pacific (ACP) pact.

II. ***Free Trade Area (FTA):-*** is an area in which members remove tariff and non-tariff barriers to trade among themselves but keep separate national barriers for third countries. This means that the member countries maintain individual trade barriers with countries outside the FTA. The agreement includes more liberalised rules and harmonisation of technical standards. Examples include the North American Free Trade Agreement (NAFTA) between USA, Canada and Mexico and South Asia Free Trade Agreement (SAFTA).

III. ***Customs Union (CU):-*** is a free trade area that has the additional application by each member country of a common external tariff against all third countries. This is in addition to removal of barriers among members. In this case the member countries agree in the unification of customs or trade policies towards non-members. But it does not call for free factor mobility and policy harmonisation. Example: the Southern African Customs Union (SACU).

IV. ***Common Market***: A common market extends from a customs union to include the liberalisation of factor movements among member countries and the application of a common external tariff to all third party countries. Example: European Economic Area.

V. ***Economic Union (Monetary Union)***: This is the most advanced stage of economic integration whereby the union involves free factor mobility, harmonization of economic policies and possibly the adoption of a common currency. According to Baldwin (1994) and Salvatore (1990) an economic union is a regional economic agreement in terms of

which the level of integration is deeper than that of FTA, customs union or common market as cited by Rathumbu (2008). For example: European Union (EU).

2.1.3. Effects of Regional Economic Integration

Economists have defined the term 'economic integration' in various ways over period. It is a process of eliminating restrictions on international trade, payments and factor mobility (Carbaugh, 2004). Thus, it results in uniting of two or more national economies in regional trading agreements. According to Biswaro (2003), regional economic integration involves the process of trade, economic and financial convergence of integrating states. According to Ng'ang'a(2006) a trading bloc is an association of countries that reduces intra-regional barriers to trade in goods and services in order to create a critical mass of production and sales in order to be competitive. The term regional integration has both static and dynamic effects.

2.1.3.1. Static Effects: Trade Creation and Trade Diversion

This is happened as a result of resource allocation in response to changing relative prices among member countries. Whereas dynamic effects are happened when there are changes in efficiency, ability to exploit economies of scale and in the level of investment and growth. Before Viner (1950) trading bloc was assumed that a customs union that would improve welfare since tariffs, which are in general welfare reducing, would fall.

However, in 1950 Jacob Viner showed that a customs union will not necessarily improve welfare since the tariff reductions occur in a world of the "second best. According to Causing (2001) whether or not the increase in trade caused by the formations of a customs union would be welfare improving depends on the increased trade. Thus a trade union will be beneficial if on balance it is "trade creating" and harmful if it is "trade diverting". If the increased territorial trade leads to the shifting of production from less efficient, high-cost producers to more efficient, low-cost producers within the union, this is known as "trade creation". If the effect of increased trade shifts production from low-cost producers outside the trading bloc to high-cost producers within the bloc, this is known as "trade diversion."

In general, trade creation means that a regional trade agreement creates trade that would not have existed otherwise. However, the opposite is true for trade diversion. In all cases trade creation will raise a country's national welfare. The trade diversion will reduce a country's national welfare though there are some cases where national welfare could be improved despite the trade diversion. The aggregate welfare effect for the country is found by summing the gains and losses to consumers, producers and the government through the regional integration.

2.1.3.2. Dynamic Effects

Besides the effects mentioned in the above, the term regional integration or here customs union also has a variety of potential dynamic effects as cited in Mengesha (2009). These may be felt more gradually but will be longer lasting and in some cases continued. First, there is the competition effect, brought about by freeing imports from partner countries. Second, there is the investment effect, which appears when there are new foreign and domestic investments that have not occurred in the absence of regional trade integration. The other is there will be created larger markets. Fourth, there is an effect on capital formation, possibly through various channels: reduction on barriers to diffusion, technological transfer, externalities from export growth, rising marginal product of capital and so on. Fifth, the union members can influence the terms of trade they face. Lastly, there will be a shift from traditional primary-products export to new industrial-products export.

2.2 Empirical Literature

Since the work of Viner (1950), several studies have been conducted examining the effects of different RTAs using various empirical methods (Clausing, 2001). For example, Krueger (1999), Drysdale and Garnaut (1993) and Eden (2008) have examined trade shares before and after an agreement in order to assess the effect of the trade agreement on trade patterns. Most of the studies that focused on regional integration have used gravity equations to assess its impact on trade flows. Helpman and Krugman (1985) are assumed as the originators of the standard gravity model as cited in (Nganga, 2006).

Also as cited in the study of Mengesha (2009), for example, Frankel and Wei (1995); Frankel and Kahler (1993); Frankel (1997) and Aitkin (1973) have applied gravity model to assess the impact of preferential trade agreement on trade flows. They concluded that the model is more appropriate for assessing the effects of regional trade agreements.

Schwanen (1997) undertakes a study of changes in Canadian trade patterns due to both CUSFTA and NAFTA (successor) between 1989 and 1995. His study concluded that trade growth in liberalized sectors by FTA outpaced trade growth in non-liberalised sectors in the agreement area. The study by Clausing (2001) that employs gravity model and used the commodity level data indicated that Canada-United States Free Trade Agreement (CUSFTA) had a substantial trade creation effects, with little evidence of trade diversion.

Similarly, Jayasinghe and Sarker (2004) conducted a study that analyzes trade creation and trade diversion effects of the North America Free Trade Agreement (NAFTA) on six selected agrifood products from 1985 to 2000. Their investigation estimates an extended gravity model using pooled data with generalized least squares (GLS) methods. The results of this study revealed that share of intra regional trade has been growing within NAFTA and this agreement has displaced trade with the rest of world. This means that due to the agreement there can be trade diversion. However, the study by Clausing explained above was not clear about trade diversion effect of regional agreement.

On the other hand, the study carried by Milner and Sledziewska (2005) which used panel data in the econometric model has come out with the result that shows the dominance of trade diversion than trade creation under European Trade Agreement. This agreement had a transitory but significant trade diverting effects for Poland's import.

The study by Mengesha (2009) under South African Development Community (SADC) has used regional dummy variables (intra and extra) in the gravity model (using ex-post approach) to capture trade creation and diversion effects separately. In this case, the estimation results of regional dummy display different signs. This means the agreement (SADC) enhances intra-regional trade for some goods and reduces for other goods within the region.

In African context, there are some empirical works that analyze the impacts of regional integration. For example, the study by Alemayehu and Haile (2002) which focused on review of prospects and challenges of COMESA membership has shown that bilateral trade flows among the regional groupings could mainly be explained by standard variables such as national income and distance. However, according to their study, the regional groupings have had insignificant effects on bilateral trade flows. Moreover, the study revealed that the performance of the bloc is mainly constrained by problems of variation in initial condition, compensation issues, real political commitment, overlapping membership, policy harmonization and poor private sector participation.The study by Lewis et al.(1999) that use a multi-region model constructed to focus on the determination of sectoral and geographic trade patterns**,** in case of SADC, concluded that trade creation dominates trade diversion for the given regional agreement as cited by Pusterla(2006).

In general, the theory of trade creation and diversion provides the foundation on which to assess the effects of formation of a trading bloc or regional agreement through empirical analysis. The research problem is to identify which effect is more likely to occur. The theoretical and empirical work reviewed in the above parts provides an approach to assess whether trade diversion or creation is the dominant outcome. This is the most important gap of this research.

2.3. Economic Background of COMESA and Its Establishment

In this section, this study presented an overview of economic background and establishment aspects of one of the African regional integration called COMESA in general.

The establishment of COMESA

The COMESA integration effort was started with a meeting of the Heads of States and Governments of member countries[2] in Lusaka on December 21, 1981. After this the

[2] *The countries include Djibouti, Burundi, Comoros, D.R. Congo, Eritrea, Ethiopia, Kenya, Madagascar, Malawi, Mauritius, Egypt, Rwanda, Seychelles, Sudan, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe.*

weakest form of regional integration called preferential trade area (PTA) came into effect on 30th September 1982. And then the Treaty establishing COMESA which replaced the former preferential trade (PTA) area was signed on 5th November 1993 in Kampala, Uganda and was ratified a year later in Lilongwe, Malawi on 8th December 1994.

The aim of COMESA is to promote sustainable economic and social development for all its member countries through enhanced cooperation leading to regional integration especially in the areas of trade, customs, infrastructures (transport and communications), science and technology, agriculture and natural resources. The main objectives of COMESA in the area of trade, among others include the creation of a free trade area (FTA) which was created in the year 2000 with nine member countries from the same bloc.

The main objective of creation of free trade area under COMESA was on the formation of a large economic and trading unit that is capable of overcoming some of the barriers that are faced by individual member states. The plan was to remove all internal trade tariffs and barriers by the year 2000. Again the plan of formation of the FTA was within 4 years to introduce a common external tariff structure to deal with all third party trade and will have considerably simplified all procedures. It has a wide-ranging series of other objectives which necessarily included in its priorities such as the promotion of peace and security in the region.

As planned the COMESA Free Trade Area (FTA) was launched in October 2000 with nine original participating countries such as Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe. They agreed to reduce the tariff rates into zero on intra-COMESA trade. And then in 2004 two countries such as Burundi and Rwanda were joined the agreement. Later on Libya and Comoros were signed the agreement in 2005 and 2006 respectively. However, other member countries have agreed to reduce the tariff rates partially for the other member countries. The region also launched its customs union (CU) in 2009, though few member countries have signed the newly created integration; the Customs Union (CU). As mentioned above, under

COMESA different forms of integration were created sequentially. All these indicated that the process of regional integration in Eastern and Southern Africa has not been episodic, rather systematic. The integration process follows a logical sequence on step by step basis. For instance in case of COMESA, firstly, a Preferential Trade Area was established in 1982, Free Trade Area (FTA) in 2000 and Customs Union (CU) in 2009.

According to COMESA 2011 annual report, total GDP of the COMESA region of 19 member countries was US$ 571,842 Millions (in current prices). In the same year the GDP of a single country; South Africa was US$ 384312.7 Millions. This accounts almost more than half of the GDP of 19 COMESA member countries. Again if we take the GDP of China for the same year, it was US$ 2,256,902.6 in current prices. This is almost four times greater than the GDP of 19 COMESA member countries. This indicates economic weakness of the member countries under the integration; COMESA.

On the other hand, according to aforementioned report, COMESA's growth performance has been quite impressive in 2011 which grew at an average of 5.8%, a slight drop from the 5.9% which was registered in 2010. The fact was this growth rate was registered when the bloc passed under persistent negative impact of the global financial crisis. In addition, in this time certain member countries have suffered from the effects of severe drought conditions and famine, and rising food and fuel prices. In addition, in the past for three decades the overall economic growth of the region was at an average 3.2 percent in a year. The other fact was the growth rate of population in the region was very high. By 2012, this region had over 458 million people, which were 280 million people in 1993. This means that within 9 years time period the population number become doubled. This could show higher population growth higher than the economic growth. Many countries of the region were also classified as Least Developed Countries (LDC's) by the United Nations.

The report also included forecasts about economic and social condition of the region. The forecasts suggest that the outlook for the future is promising provided member countries adopt and implement strategies which will further outward-orientated regionalism in the process of becoming fully integrated into the global economy. The fact

was most COMESA countries were individually too small to achieve economies of scale in the production and marketing of their products. Thus, they need to work together as a region so that to achieve significant levels of economic growth and compete in a world market which has been dominated by large trading blocs and larger economy.

On the other hand, according to the contemporary studies and the report, in relation to this COMESA, the role of the private sector in the process of economic growth is not insignificant. The economic performance of the bloc has been dependent on the performance of the private sector. Although COMESA could offer an attractively-sized and harmonized market for many people and countries and also it has many natural resources and investment opportunities, it was not good in political and economic relation. Thus it should offer a stable and attractive political and economic environment for the countries so that to attract FDI into the region.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. The Gravity Model

The method to be employed for assessing the trade effects of COMESA trade agreement in this study was augmented gravity model. This model was widely used in evaluating the effects of regional trade agreements on trade between member countries (Mengesha, 2009). As cited in Mengesha (2009) some authors including Frankel and Wei (1995); Frankel and Kahler (1993); Frankel (1997); Krueger (1999); Aitkin (1973); Aitkin and Obutelewicz (1976) and Willmore (1976) apply gravity model to assess the impact of preferential arrangements on trade flows. It is a popular formulation for empirical analyses of bilateral trade flows between two countries.

Originally, in 1687, Newton proposed the "Law of Universal Gravitation." It was all about gravitational force between two objects (Atnafu, 2007). This law from physics states that force of gravity between two objects is proportional to the product of the masses of the two objects divided by the square of the distance between them, which is given by:

$$F_{ij} = G\frac{M_i M_j}{D^2 i_j} \quad \text{.....(1)}$$

Where, F_{ij} is the attraction force, M_i and M_j are the masses of objects i and j, D_{ij} is the distance between the two objects(i and j) and G is a gravitational constant depending on the units of measurement for mass and force. Since then, economists discovered the gravity model to apply in international trade when Tinbergen (1962) and Poyhonen (1963) proposed that roughly the same functional form could be applied to international trade flows. This means that the volume of trade (mostly export) could be estimated as an increasing function of the national income (GDP) of the trading partners, and a decreasing function of the distance between them. Consequently, a large number of empirical works applied gravity model to inspect the trade creation and diversion effects

of the RTAs. After the contribution of Tinbergen and Poyhonen, the gravity model has been widely used to estimate bilateral trade flows among countries.

According to this model, flows of trade between two countries are explained by their economic sizes (GDP or GNP), population (Linneman, 1966) and direct distances (from their capital cities) between the countries as cited in Menegasha (2009). In its original form, it was specified as follows:

$$Yij = A\frac{GDP_i.GDP_j}{D^2{}_{ij}} \quad \text{.....(2)}$$

Where Y_{ij}-trade among countries i and j, GDP_i and GDP_j are country i and country j GDPs respectively, D_{ij} is distance between two countries and "A" is constant of proportionality. Despite the fact that the gravity model is formulated in the multiplicative form as can be seen from equation (2) above, the standard procedure to estimate the equation is to take the natural logarithm of all the variables in the equation which enables estimation of the parameters by least squares regression (Bobkov, 2012).Then, the log-linearised version of this basic gravity model (equation 2) is:

$$Log(Y_{ij}) = A + b_1 \log(GDP_i.GDP_j) - b_2 \log(D_{ij}) + \varepsilon i_j \quad \text{.....(3)}$$

Where, *A* is constant (intercept) and, b_1 and b_2 are coefficients to be estimated. The error term ε_{ij} captures any other shocks and chance events that may affect bilateral trade between the two countries. This model has been used to investigate bilateral trade patterns. In addition, the model is employed to assess the effects of trade policies such as the impact of regional integration agreements on trade flows, level and direction of trade. To estimate whether regional trade agreement has a significant effect or not, a regional binary dummy variable was included in the abovementioned model which took the value of one if the two countries were members of the RTAs or zero otherwise. The estimated coefficients on the dummy variables may capture a range of policy and other (including misspecification) effects rather than the regional trade policy effect under investigation.

3.2. Model Specification

According to many empirical findings the gravity model has been recognized for its empirical success in explaining trade flows between countries. Besides it has been widely applied to evaluate the impact of trade policies in either level of trade or direction of trade among members. Consequently, the use of gravity model in assessing the effects of COMESA agreement on intra and extra COMESA trade would be appropriate for this study.

Regarding the specification of the gravity equation, due to the lack of a strong and univocal theoretical foundation, the variables used differ from study to study. As far as the dependent variable is concerned, some authors use total (or average) trade while others adopt data on exports or imports only (Cardamone, 2009). The work of Mengesha (2009), in case of SADC, the dependent variable was bilateral trade flows (i.e. export trade value between member countries). At the same time the study adds some extra affecting variables such as common language and common border on the basic gravity model (equation 2). Thus, following such works the current study employed the augmented gravity model to analyse the effects of the COMESA membership on the trade flows (export value) across the member countries. Then, the model takes the following general form:

$Y_{ij}=f\ (GDP_i, GDP_j, N_i, N_{j,} D_{ij}, CL_{ij}, CB_{ij}, COMESA_{ij})$.

Then to examine the effects of COMESA membership in the bilateral trade linkage between country i and country j the given equation must be transformed into:

$$LnY_{ij}=Bo+B_1lnGDP_i+B_2lnGDP_j+B_3lnN_i+B_4lnN_j+B_5lnDij+B_6CB_{ij}+B_7CL_{ij}+B_8COMESA_{ij} + B9COMESA_{Oij}+ \varepsilon_{ij,}$$

Where Y_{ij}-bilateral trade flows(export value) between country i and country j, CL_{ij}-represents a dummy variable that denote common language which takes the value unity if countries i and j use the same language and zero otherwise, CB_{ij} is also a dummy variable for common border which takes unity if both countries used common border and zero otherwise. $COMESA_{ij}$ is a dummy variable which takes the value unity if both *i* and *j*

belong to the same RTA; COMESA and zero otherwise and $COMESA_{Oij}$ is a dummy variable that takes the value unity if the importing country is a member of the RTA and the exporting country is a non-member; zero if otherwise.

Here the dummy variable "$COMESA_{ij}$" is introduced following the work of Coulibaly (2004), so that to capture intra-bloc and extra trade effect of the COMESA as a whole by taking one for membership and zero otherwise. Changes in the coefficients of intra-trade $COMESA_{ij}$ and overall bloc imports $COMESA_{Oij}$ will determine whether trade creation/diversion has occurred following formation of the RTA.

Trade creation will be found when the change in both the intra-bloc coefficient ($COMESA_{ij}$) and overall bloc imports ($COMESA_{Oij}$) is positive. Trade diversion will be identified when an increase in intra bloc trade coincides with a decrease in overall bloc imports from non-members. In addition, following others work mentioned in this study and to control observable country pair specific factors which can affect bilateral trade, the model includes common language and border.

According to Linneman (1966), the other explanatory variable in the given equation model is population of the both countries. However, the signs expected for populations are ambiguous; there is no empirical evidence of a consistent sign for population (Cheng and Wall, 2005). Indeed, in most papers its sign is expected to be positive because it is believed that larger countries trade more. However, it has been shown (Oguledo and Macphee, 1994) that if an exporter is large in terms of population it may either need its production to satisfy domestic demand, so that it exports less, or it may export more than a small country, as it is the case when large firms achieve economies of scale. The same reasoning can be applied to the case of the importing country: if it is large, it may either import less because it is likely that the domestic sector develops and makes the country self-sufficient, or it may import more because it cannot satisfy all domestic demand with its own production (Pusterla, 2007).

3.3. Estimation Techniques

Various techniques of estimations are employed for panel data gravity model estimation including ordinary-least squares (OLS), fixed (random) effects estimation; generalized least-- squares (GLS), and Tobit estimation. The use of different panel data methods, such as random or fixed (within) effect estimators, allows for various assumptions regarding trade flows to be analyzed and tested (Mengesha, 2009).

In addition, the work by Clarete *et al.* (2002) employed ordinary least squares (OLS) method when estimating the gravity model. However, following the work of Mengesha (2009) this study employed random effects model through generalised least squares (GLS) to estimate the model. This estimation method was more appropriate to estimate regional integration effects. The model was estimated in natural logarithms.

The model was estimated with the data for Y_{ij} and all other explanatory variables for the period between 2000 and 2012. In case of expected sign, for the explanatory variables GDP, population, common border, common language and COMESA experienced positive signs and the other explanatory variable such as distance has experienced negative sign.

3.4. Data, Data Description and Data Sources

Many empirical literature on gravity model use total bilateral trade flows as dependent variable. However, Cernat (2001) suggests the use of bilateral export flows arguing that for a given pair of countries, with total bilateral trade one cannot distinguish between the impacts of RTA formation on exports from non-member to RTA members and/or exports from the RTA member to the non-member. For the present study, export flow is used as dependent variable.

To achieve the objectives mentioned in the current study, the study mainly used secondary data for nineteen countries for thirteen years covering from 2000-2012. The main sources of data for this study were IMF's direction of trade statistics (DOTs), World Bank's World Development Indicator (WDI) CD Rom, UNCTAD, www.indo.org

(distance data in kilometre), COMESA web page, World Fact Book (for language and common border data) and other web pages. For sample case, the study considered 19 countries: 12 countries from COMESA membership, 2 countries that share the same border with COMESA member countries and 5 countries from outside that they do not share the common border and language but practice trade with COMESA member countries. Due to data problem the study was obliged to consider twelve countries only from COMESA member countries. On the other hand, since the member countries are similar in different aspects, these twelve countries can represent the members of the integration.

CHAPTER FOUR

RESULTS AND DISCUSSIONS

4.1. Descriptive Analysis

Trade Performance of the COMESA

As revealed on the figure 1 below, in the year 2000 the export share of intra-COMESA trade was 5%. And its share towards Rest of the World (RoW) is 95%. In the year 2012, the export share of COMESA under intra-trade system is 7% and the export share towards Rest of the World is 93%. From this it can be concluded that the export share of COMESA towards its intra-trade is low. In the 12 years time period the export share of intra-COMESA trade was increased only by 2%. This indicates the weakness of the COMESA in facilitating trade among its member countries though there has been a slight increasing trend in export share towards the region.

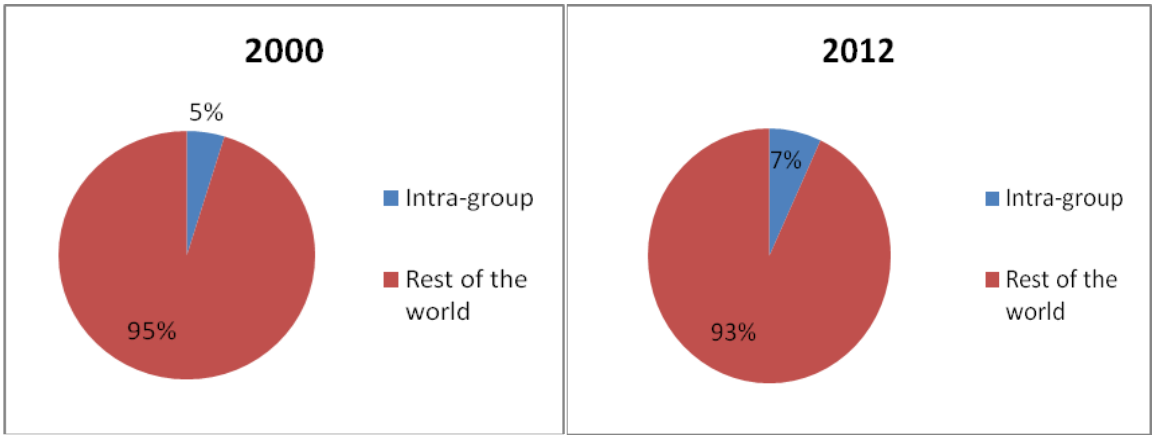

Figure 4.1. Export Share Trend of COMESA by Destination

Source: Compiled from UNCTAD and COMESA COMSTAT Database

As shown in the figure 2 the share of COMESA in its intra-imports was 5% in 2000. And its share of imports from rest of the world was 95%. In the year 2012 the import share of COMESA under intra-trade system is 6% and its import from rest of the world was 94%. This revealed that the intra-import share of COMESA was low. In the 12 years time period the intra-import share of the region was increased only by 2%. There was a slight increasing trend in imports from members. This also indicates the existence of weak

integration in trade among COMESA member countries and the member countries were importing from non-member countries.

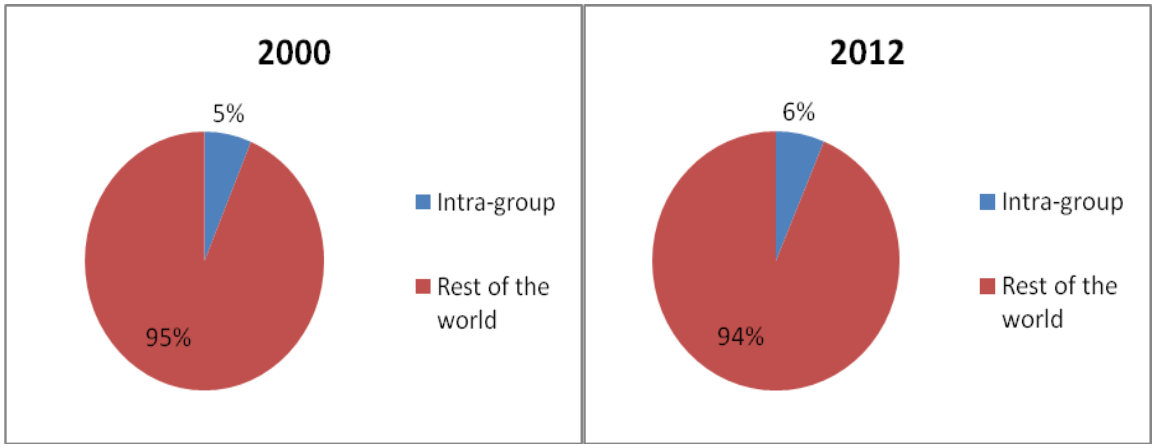

Figure 4.2: Import Share Trend of COMESA by Destination in 2000 and 2012

Source: Compiled from UNCTAD and COMESA COMSTAT Database

As revealed on the figure 3 below on average more than 89.33% of exports of African Regional Blocs flow towards non-member countries of the world. And intra-export of the African blocs in the given year accounts only 10.7%. This also indicated low trade relation among member countries.

In the same fashion, the trade relation among member countries of African blocs was low in the year 2012. In case of COMESA, there was a slight improvement when it was compared with other regional blocs. For example, in the year 2000, the intra-export share was 4.72%. In the year 2012 its share increased into 6.93%. This indicates some improvement under COMESA.

However, in the given two years, referring ECOWAS, SADC and SACU, there was no improvement in intra export trade share trend.

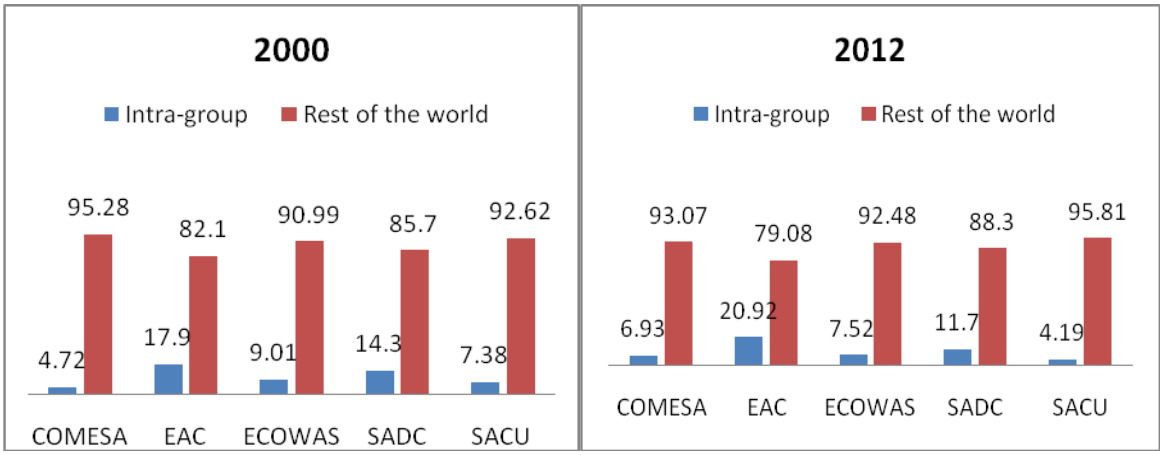

Figure 4.3: Export Share Trend of African Regional Blocs by Destination

Source: UNCTAD

As can be seen from figure 4 below the import share of COMESA in intra-COMESA trade is 4.86 %(2000) and its import share from outside is 95.14 %(2012). This indicates that the bloc has more trade with non-member countries than the member countries. Again, when the share was compared with other regional blocs, it reflected very low intra-import trade. However, in the indicated years, the share of both import and export flow of SADC was better than other African regional blocs. In general, in both cases the intra-trade share of COMESA was very insignificant.

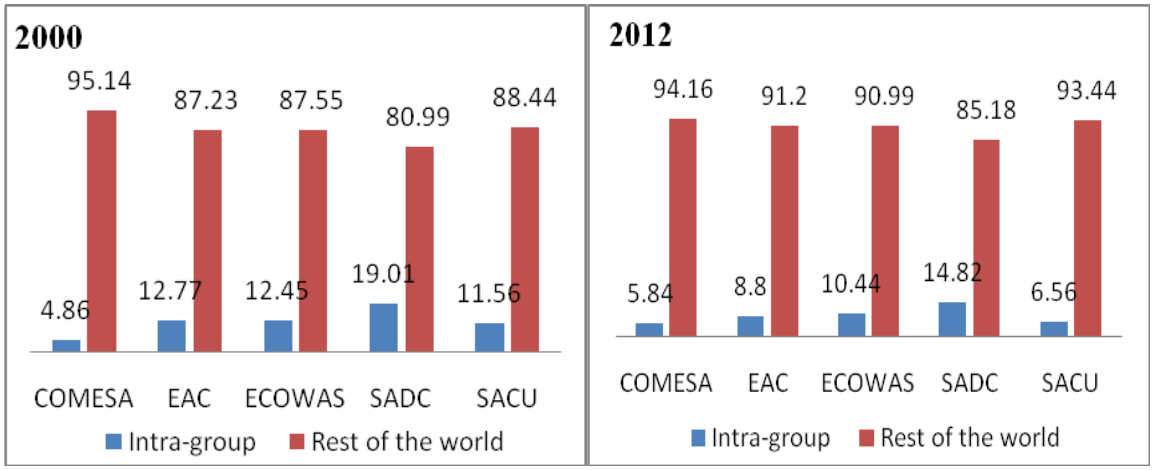

Fig.4.4. Import Share Trend of African Regional Blocs by Destination

Source: UNCTAD

As shown in the table 3.1 below, the percentage of intra-COMESA trade to total COMESA trade in 2011 was 8%. In 2012, it was slightly declined to 7%. This may be due to either decrease in trade among COMESA members or increase in trade with non-members. When we see each country's trade level for indicated years, countries such as Rwanda, DR Congo, Zambia, Burundi, Uganda and Malawi were trading more within the region. On the other hand, Libya and Egypt had the low level of trade within the region. In general, almost many countries of the bloc had the low trade participation other member countries. This indicated that member countries had a higher trade relation with non-member countries than the member countries.

Table 4.1: Intra-COMESA Trade as a % of Total Trade by Each Sample Country, 2005 – 2012

Member countries	2005	2006	2007	2008	2009	2010	2011	2012
Burundi	18	17	26	22	26	25	19	19
Egypt	2	2	2	4	4	4	3	3
Ethiopia	6	8	5	5	4	5	5	4
Kenya	16	12	11	11	11	12	12	11
Madagascar	6	4	5	3	5	7	5	5
Malawi	14	13	15	9	10	13	14	15
Mauritius	4	4	5	5	5	4	5	5
Rwanda	32	48	38	40	37	33	29	34
Swaziland	2	5	9	9	6	4	3	1
Uganda	28	20	22	20	21	21	21	14
Zambia	13	9	12	16	16	17	17	19
Zimbabwe	5	5	6	6	6	7	8	7
Comoros	3	9	3	5	5	8	5	19
DR Congo	8	12	18	17	22	21	22	24
Djibouti	9	1	8	4	18	28	37	5
Eritrea	9	13	5	13	17	33	13	13
Libya	1	1	1	2	3	3	3	4
Seychelles	2	2	3	4	6	4	12	3
Sudan	5	5	5	4	4	5	6	9
Total	**5**	**5**	**6**	**6**	**6**	**7**	**8**	**7**

Source: COMESA COMSTAT database

As reflected in the table 4.2 below, trade between the COMESA member countries and the rest of the world increased from US$244 billion in 2010 to US $270 billion in 2011. This means it grew by 11 percent. Total exports rose by 9% from levels of US $107 billion in 2010 to US $116 billion in 2011, while imports also registered a 12% growth, from US $137 billion in 2010 to US$153 billion in 2011.

The growth in both total exports and imports is 9% and 12% respectively. However, this growth rate was lower than the corresponding growth for both flows in the year 2010 which was 26% and 16% respectively.

Table 4.2: Global COMESA Trade, 2002 - 2011, Values in US$(in Millions)

Flows	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Export	25476	34247	41039	53701	71062	73777	110028	82841	103888	112682
Re-Export	702	1152	1436	2093	1816	2100	2603	2469	3183	3527
Total	26178	35399	42475	55794	72878	75877	112631	85310	107071	116209
Import	41706	39230	44185	62309	71887	88642	136245	118489	137013	153644
Total Trade	**67,884**	**74629**	**86660**	**118103**	**144765**	**164519**	**248876**	**203799**	**244084**	**269853**

Source: Compiled from UNCTAD

The facts indicated in the table 4.2 above are also shown in the figure 4.5 below. It reflects increasing trends of both export and import flows for the years covering from 2002 to 2011.

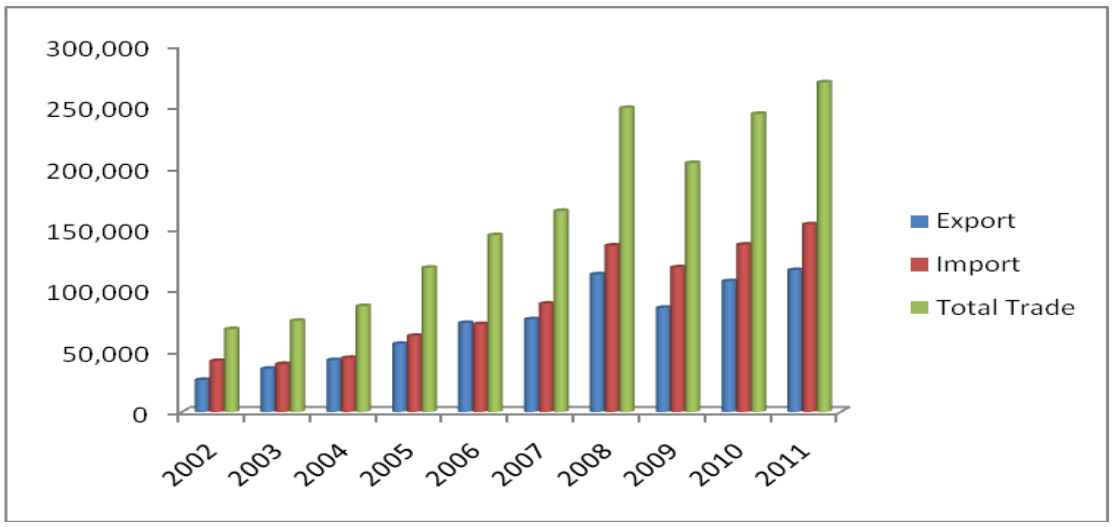

Figure 4.5: Global COMESA Trade, 2002-2011

Source: UNCTAD

Again, as revealed in the table 4.3 below intra-COMESA trade increased from US$17.3 billion in 2010 to US$18.8 billion in 2011. This means that the trade grew by 8% in 2011 over 2010. According to the source, the 8% growth in intra-COMESA trade for 2011 can be attributed in part to registered growths in intra-trade among countries like Kenya, Zambia, Burundi, Mauritius and Uganda.

Table 4.3: Intra-COMESA Trade, 2002-2011, Values In US$ Millions

Flow	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Export	1882	1670	1804	2583	2702	3950	6157	5879	7781	8181
Re-export	267	475	531	625	268	570	614	742	1259	1754
Total	2149	2145	2335	3208	2970	4520	6772	6621	9040	9935
Import	2218	2173	2223	3046	3757	4554	6932	6110	8337	8886
Total Trade	4368	4318	4558	6254	6728	9074	13704	12731	17376	18821

Source: COMESA COMSTAT database

The results mentioned on the table 4.3 are also shown in the figure 4. 6. Here intra-COMESA trade showed the increasing growth trend over the given time period. Both import and export flows suggest increasing trends though the share was insignificant for some years.

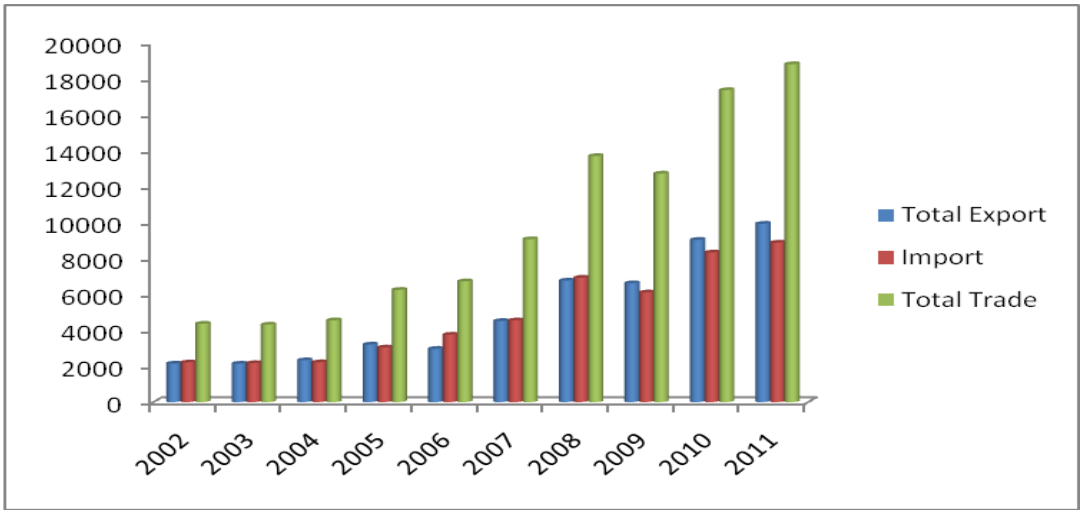

Figure 4.6: Intra-COMESA Trade, 2002-2011

Source: UNCTAD

As revealed in the table 4.4 from COMESA member countries, in 2011 both Kenya's intra-COMESA exports and imports grew by 30% and 23% respectively. The intra-COMESA exports for Zambia and Burundi was increased by 80%. And Burundi's intra-COMESA imports grew by 49% during the period under review. Again the intra-COMESA imports for Zimbabwe also grew by 70%.

However, Madagascar was only a member country that did not show any improvement in both export and import flows. Some other countries like Swaziland and Zimbabwe showed negative growth rate. This indicated that all COMESA member countries had no similar both import/export share under intra-COMESA trade system for indicated years. The effects of the integration were not the same for all member countries.

Table 4.4: Intra-COMESA Trade by Country, 2010 - 2011,

Values in US$ millions

	2010		2011		% Change (2011)	
Country	Exports	Imports	Exports	Imports	Exports	Imports
Burundi	17.6	105.9	31.5	157.7	79.2	49
Egypt	2343.7	961.8	1622.5	834.8	4139.4	49.2
Ethiopia	286.9	286.2	315.4	289.4	10	1.1
Kenya	1439	504.1	1760.1	617.5	22.3	22.5
Madagascar	38.9	197.3	38.9	197.3	0	0
Malawi	215.4	231.8	308.5	225.6	43.2	-2.7
Mauritius	85.7	125.3	99.6	152.9	16.1	22.1
Rwanda	68.9	415.2	115.9	368	68.2	-11.4
Swaziland	139.4	10.7	94.6	7	-32.1	-33.9
Uganda	487.5	586.9	647.8	659.5	32.9	12.4
Zambia	590.4	1394.2	1062.6	1636.6	80	17.4
Zimbabwe	253.8	271.2	136.5	462	-46.2	70.4

Source: COMESA COMSTAT database

As reflected in the table 4.5 concerning the major export markets for COMESA products, EU was ranked number one with exports worth of US$46 billion destined to the EU market in 2011.

However, in 2010 it was US$43 billion. This represents a 6% increase in exports towards EU. After the EU, China ranked the second place as a major export market for COMESA products with exports worth over US$17 billion in 2011. It showed 2% growth over the previous year's levels.

Table 4.5: COMESA Countries Major Export Trade Markets 2001 - 2011 Values in US$ (in Millions)

Market	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2010 rank	2011 rank
EU	4727	13915	17864	22840	29685	38027	38053	55014	34889	43308	45894	1	1
China	1010	832	2116	1932	3462	7000	3079	12180	11659	17141	17407	2	2
COMESA	1719	2149	2145	2335	3208	2970	4520	6772	6621	9040	9935	3	3
Switzerland	277	796	948	1266	1823	3214	3714	5791	3930	4909	5823	5	4
S. Africa	1086	1418	2926	2506	1785	2483	3105	2529	2695	4262	5717	6	5
USA	917	1161	1516	2071	3548	4865	5201	6350	4285	4950	4985	4	6
U.A.E	123	177	272	305	873	1272	859	1586	2104	3105	3359	7	7
India	323	497	635	548	693	1948	1854	2752	2401	1678	2668	9	8
S. Arabia	189	400	408	524	764	754	903	1695	1827	1973	2256	8	9
Turkey	88	773	1142	1649	2161	681	669	1168	1236	1451	1974	10	10

Source: COMESA COMSTAT database

4.2. Econometric Regression Analysis

To answer the second objective discussed in the first chapter of this study, panel data analysis was preferred. Panel data are known as longitudinal or cross-sectional time-series data. It allows controlling the variables which cannot be observed or measured like cultural factors or difference in business practices across companies; or variables that change over time but not across entities (i.e. national policies, federal regulations, international agreements, etc.). There are two estimating models for panel data analysis. These are fixed effects and random effects model.

4.2.1. Fixed Effects Model

This is used whenever there is an interest in analyzing the impact of variables that vary over time. It explores the relationship between predictor and outcome variables within an entity (country, person, company, etc.). When using FE we assume that something within the individual may impact or bias the predictor or outcome variables and we need to control for this. This is the rationale behind the assumption of the correlation between

entity's error term and predictor variables. FE removes the effect of those time-invariant characteristics from the predictor variables so we can assess the predictors' net effect.

Another important assumption of the FE model is that those time-invariant characteristics are unique to the individual and should not be correlated with other individual characteristics. Each entity is different therefore the entity's error term and the constant (which captures individual characteristics) should not be correlated with the others. If the error terms are correlated then FE is not suitable since inferences may not be correct and it needs to model that relationship. In this case scholars suggest using random-effects model. However, this selection is done by the Hausman test.

4.2.2. Random-Effects Model

The rationale behind random effects model is that, unlike the fixed effects model, the variation across entities is assumed to be random and uncorrelated with the predictor or independent variables included in the model. The crucial distinction between fixed and random effects is whether the unobserved individual effect embodies elements that are correlated with the regressors in the model, not whether these effects are stochastic or not (Greene, 2003). In this case if there is a reason to believe that differences across entities have some influence on the dependent variable then random effects should be used. One advantage of random effects is that we can include time invariant variables (i.e. dummy variable). It assumes that the entity's error term is not correlated with the predictors which allows for time-invariant variables to play a role as explanatory variables. RE allows generalizing the inferences beyond the sample used in the model.

4.2.3. Fixed or Random: Hausman Test

To decide between fixed or random effects scholars run a Hausman test. It is a test which is usually used to choose between fixed effect and random effect methods of estimation. The Hausman method tests the null hypothesis of no difference in coefficients estimated by the two distinct methods against its alternative hypothesis.

The hausman test is presented as follow.

Hausman Test

```
. hausman fixed random

                 ---- Coefficients ----
             |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
             |     fixed       random       Difference          S.E.
-------------+------------------------------------------------------------
      lngdpi |    .7488766     1.134209      -.3853321        .1160381
      lngdpj |    .6214197     .6638872      -.0424676        .0890013
      lnpopi |    1.500369    -.0460636       1.546433        .6013498
    lndistij |    .5746987    -1.051869       1.626568        1.398782
      bordij |    .9691451     1.573284      -.6041387        1.803348
------------------------------------------------------------------------------
                           b = consistent under Ho and Ha; obtained from xtre
            B = inconsistent under Ha, efficient under Ho; obtained from xtre

    Test:  Ho:  difference in coefficients not systematic

                  chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                          =      44.60
                Prob>chi2 =     0.0000
```

The result of test suggests not to reject the fixed since its probability is 0.0000. However, since the fixed effects estimator dropped the interest variables such as COMESA, and COMESA0ij, the current study employed random effects model. In addition, following the work of Mengesha (2009), this study applied random effects model so that to estimate the model with GLS.

4.2.4. Estimation Results

This section discusses the estimation results. Table 4.6 portrays regression results using STATA. In table (4.6) below important information such as the values of coefficients for the explanatory variables, standard errors for each coefficient, R_2**,** 'P' values for each coefficient, number of observations, regression method and other important information are shown.

Table 4.6: Regression Results (Log of Export Value of Exporter Country as Dependent Variable) - Random-Effects GLS Regression

Wald chi^2 (8)	= 1591.32	Number of obs	= 4445
Prob > chi2	= 0.0000	Number of groups	= 342
R-sq: within	= 0.1435	Obs per group: min	= 12
Between	= 0.7262	avg	= 13.0
Overall	= 0.6226	max	= 13
corr(u_i, X)	= 0 (assumed)		

lnexp1	Coef.	Std. Err.	P>z
lngdpi	1.134209	.0582941	0.000
lngdpj	.6638872	.0539848	0.000
lnpopi	-.0460636	.0896258	0.607
lndistij	-1.051869	.1891598	0.000
bordij	1.573284	.4618162	0.001
langij	1.396544	3122738	0.000
comesaij	1.397314	.3516149	0.000
comesa0ij	-.571239	.413785	0.167
-cons	-18.46979	2.127229	0.000

Source: compiled by the author from different international sources

The R^2 indicates the explanatory power of the independent variables in the model. The R^2 is the term implying about percentage of the variation in export trade between member countries and non-member countries is explained by at least one explanatory variable in the model.

The P>/z/ column indicates the level of significance for each explanatory variable in the model. The conventional 'p' values for an explanatory variable to significantly affect a given dependent variable must be less or equal to 5 percent or 0.05 in levels. A variable is said to be significant at 1 percent level of significance, if it has a coefficient with 'p' value of less than or equal to 1 percent. Also if it has p value of greater than 1 percent but less or equal to 5 percent, it is called significant at 5 percent level of significance. A variable is insignificant if it has a coefficient with 'p' value greater than 5 percent.

The equation (model) is in linear- log form that is the dependent variable is in levels and the explanatory variables except for the dummy variables such as COMESA, common language and common border are in logarithmic forms. Hence, the values for the explanatory variables except for such dummy variables are elasticity and the values for the dependent variable are in levels. Therefore, interpretations are in terms of percentages and levels. The results and interpretations for each explanatory variable in the model are discussed blew.

When the export value is dependent variable all variables are found to be significant. The coefficients of GDPs of exporter and importer countries are 1.134209 and 0.6638872 respectively implying their positive effect on export trade of exporter country. These coefficients are in line with the expected positive sign. These explanatory variables are significant at 1 percent level of significance as they have p values of less than 1 percent (0.000). Other things held constant, a 1 percent increase in the product of GDP of exporter country results in a 1.134209 units (US dollar) increase in value of export trade flows between exporting country and its trade partners and vice versa. Similarly, a 1 percent increase in the product of GDP of partner country results in a 0.6638872 units (US dollar) increase in value of export trade flows between exporting country and the

trade partner and vice versa. As the results indicate the effect of the product of GDP of exporter country is higher than the effect of the product of GDP of the importing country.

Distance is the second important explanatory variable which is expected to affect bilateral trade flows between two member countries or trade partners. It has a negative coefficient (-1.051869) as hypothesized(in section 3.3) and is significant at 1 percent level of significance as it has a 'p' value of 0.000 which is less than 1 percent (0.01). Hence, distance negatively and significantly affects bilateral trade flows between the member countries. Other things remaining constant, on average 1.051869 units(US dollar) decrease in trade between two trading countries is attributed to an increase in distance by 1 percent and vice versa.

Population is one of the explanatory variables in the given model. The sign expected for population is ambiguous; there is no empirical evidence of a consistent sign for population (Cheng and Wall, 2005). The expected sign of this variable in this study was positive sign (section 3.3.). However, the regression result indicates a negative sign (-0.0460636). The population of exporter country insignificantly affects the bilateral export trade. This is because it has a p value of 0.607 or it has more than 60 percent of level of significance (60.7%). Other things remaining constant, a 1 percent increases in population number results in a 0.2717933 units (US$) decrease in export trade between member countries and vice versa.

The other important explanatory variable in the model is the dummy variable common border. This explanatory variable has the expected positive sign (1.573284) and it is significant at less than 1 percent level of significance as it has a "p" value of 0.001 or 0.1 percent. Hence, common border positively and significantly affects bilateral export trade flows between the member countries. The regression result of this variable is according to the theoretical expectations which assume that countries which share a common border are more likely to trade with each other than countries which do not share a common border. They trade more than the countries which do not have common border by the amount of 1.573284 units (US$).

The other explanatory (dummy) variable in the model is common language. This explanatory variable also has the expected positive sign (1.396544) and it is significant at 1 percent level of significance as it has a "p" value of 0.000. Thus, common language positively and significantly affects bilateral export trade flows between the member countries. This is in line with the formulated theoretical expectations which assumes that countries which shares the same language are more likely to trade with each other than countries which have different languages. In this case they trade more by the amount of 1.396544 units (US$).

Concerning the estimated coefficient of $COMESA_{ij}$ regional dummy variable, the estimation result has an expected positive sign such as 1.397314. The coefficient is significant at one percent level of significance since it has a "p" value of 0.000. This indicates that participation in the COMESA membership enhances exports and has the trade creating effects. Its intra-bloc effect is [100*(exp1.397314-1) = 304]. This indicates an intra-COMESA trade level. It suggests that COMESA members traded 304% more among themselves than they traded with RoW.

In relation to the estimated coefficient of $COMESA_{0ij}$ dummy variable, the model estimation reflected expected negative sign. However, the coefficient is statistically insignificant. This is because it has a "p" value of 0.167 which is more than 10 percent level of significance (16.7%). This shows the insignificant trade diversion effect of COMESA for the given year. This means that the export flows favour to member countries than non-member countries though the result shows the insignificance of the variable. The diversion level is given by [100*(exp0.571239-1) = 77]. When both diversion level and trade creation are compared, trade creation (304%) level outweighs the trade diversion (77%) effect for this study. In general, this study suggests that COMESA has both trade creation and diversion effects in the given time period. However, its trade creation effect is higher than trade diversion effect.

CHAPTER FIVE

CONCLUSIONS AND POLICY IMPLICATIONS

5.1. Conclusions

This study tries to assess the trade effects of regional trade agreement on member countries for the case of COMESA. To this end the study employed augmented gravity model for the analysis of panel data. The study mainly focuses on assessing both trade creation and diversion effects of COMESA. With regards to these effects, there are many existing studies which estimate the trade effects of different regional trade agreements. Specifically, with relation to COMESA, many existing studies estimate the gravity model by employing cross-sectional data. Again, they were mostly limited to the time period of preferential trade area (PTA) and earlier period of free trade area (FTA) under COMESA.

However, the time frame for the current study covers the years 2000-2012 for twelve COMESA member countries and seven non-member countries. This time frame included the whole time period of Free Trade Area (2000-2009) and some years from Customs Union (2009-2015) under COMESA regional agreement. Again, this study employed panel data for thirteen years. This is relevant to COMESA given that there is no common consensus on the effects of regional trade agreement among the existing literatures. In addition, the effects of regional trade agreement can vary depending on a type of integration forms launched. Thus, the current study considered the advanced stage of COMESA (i.e. FTA and CU) since the time frame covers the years 2000-2012. This can reflect the true effects of regional trade agreement on the member countries.

In this study the effects of the COMESA agreement on the intra COMESA export flows for member countries is estimated. The results are almost similar to the existing literatures except the levels of the trade and the sign of population and COMESA0ij variables. Even though the COMESA trade effects have not been estimated for individual countries, the estimation results indicate the existence of both trade creation and diversion effects on the member countries of the bloc.

For looking in detail the export trade flows are positively related to GDPs, common border and common language. However, it is negatively related to distance and population. According to the existing literatures there is no consensus on the expected sign of population. It can be either positive or negative. In the current study its sign is negative. This can suggest the existence of more consumption effects than production effects domestically.

In relation to the interest variable for this study, the estimation result for $COMESA_{ij,}$ regional dummy variable shows the expected positive sign and significantly affects the intra-export trade of the region or member countries. However, this does not mean that this result is the same for all individual member countries and products. To know the trade effect of integration for all countries, there must be a regression analysis at each country level. This means that there may be some member countries and products for which the estimation results show negative and insignificantly affects the region's bilateral trade flows.

With regards to trade diversion variable, $COMESA_{0ij}$, the estimation result shows negative sign. However, the variable is insignificant and has negative effects. It indicates direction effects of the given integration. This suggests more export trade flow towards the member countries than non-member countries. In general, the formation of COMESA enhances intra-export trade among member countries than non-member countries. In this study, the trade creation effects dominate the trade diversion effects.

5.2. Policy Implications

The results of descriptive analysis show weak performance of COMESA in its export and import trade flows. These results indicate that though there were slight increasing trends of both import and export trade flows towards the members in the given time period, its share was very low. This suggests the agreement to strength its membership of member countries.

At the same time the regression results about COMESA show a positive future. The interest variable, COMESA membership positively and significantly affects the export trade among its member countries. However, the level of its effect on export trade was very low. Even though there is no doubt about the COMESA as the way to the bright future in trade relation, its membership is not fully integrated. This indicates the weakness of the integration. Thus, this regional bloc should vigorously pursue its plan for fuller regional integration duly in accordance with the treaty. This suggests that there must be strong political responsibility so that to keep in working for integration agenda of the given bloc. In addition, there must be strongly functioning Customs Union. Again the policy organs have continued to review the operation of the COMESA free trade area to establish progress towards a fully market relating to free movement of goods among all member countries. In general, all member countries must be ready to accept the COMESA free trade area agreement fully and remove any trade barriers.

On the other hand, the two dummy variables such as common language and common border have positive and significant effects on export trade of the member countries. This suggests countries to have more trade with those countries which have common border and language.

Concerning the economic size of COMESA member countries, it has also positive and significant effect on countries trade flows. This also suggests member countries to give attention for their economic growth and development of infrastructure among themselves.

In general, it is expected that all member countries will remove all tariff and non-tariff trade barriers and also there will be strong political responsibility and willingness among the leaders so that to integrate the market fully and exploit the merits of the COMESA integration.

REFERENCES

Atnafu, G. (2007).*The Impact of China and India on African Manufacturing Exports on the Third Market:* Gravity Approach and A Test of Flying - Geese Theory for Africa.

Baldwin, E., and Venables J. (1995). *Regional Economic Integration, (eds)*. *Handbook of International Economics*, vol. III, Elsevier Science, Amsterdam.

Bergstrand, J.H. (1985). *Gravity Equations in International Trade*: Some Microeconomic Foundations and Empirical Evidence. Review of Economics and Statistics 67.

Biswaro, J.M. (2003). *Perspectives on Africa's Integration and Cooperation from OAU to AU*: An Old Wine in a New Bottle. WIU, Washington.

Bobkov, (2012). *Gravity Model Estimation Using Panel Data*: Is Logarithmic Transformation Advisable? World Trade Organization, a Practical Guide to Trade Policy Analysis.

Buigut, S. (2012). *An Assessment of the Trade Effects of the East African Community Customs Union on Member Countries.* International Journal of Economics and Finance; Vol. 4, No. 10; 2012.

Carbaugh, R.J. (2004). *International Economics*, (eds). Australia, South-western.

Cardamone, P. (2009). *A Survey of the Assessments of the Effectiveness of Preferential Trade Agreements Using Gravity Models*, Working Paper 07/09.

Cernat L. (2001) "Assessing Regional Trade Arrangements: Are South-South RTAs More Trade Diverting?" *Policy Issues in International Trade and Commodities Study* Series No. 16, United Nations Conference on Trade and Development.

Cheng, I.H., and Wall, H. J. (2005). *Controlling for Heterogeneity in Gravity Models of Trade and Integration.* Federal Reserve Bank of St. Louis Review, 87, pp. 49-63.

Clarete, R., Edmonds, C., and Wallack, J. (2002). *Asian Regionalism and Its Effects on Trade in the 1980s and 1990s.* Journal of Asian Economics 14 (1): 91–129.

Clausing, A.K. (2001). *Trade Creation and Trade Diversion in the Canada-United States Free Trade Agreement.* Canadian Journal of Economics 34: 677-96.

COMESA. (2007). *Annual Report of COMESA.*

COMESA. (2011). *Annual Report Submitted for the Common Market for Eastern and Southern Africa for the Year 2011*.

Coulibaly, S. (2004). *On the Assessment of Trade Creation and Trade Diversion Effects of Developing RTAs*. *University of Lausanne.*

Drysdale, P., and Garnaut, R. (1993). *The Pacific: An Application of a General Theory of Economic Integration*, *In Pacific Dynamism and the International Economic System.*

Eden, K. (2008). Trade among COMESA Member Countries: A Gravity approach. Unpublished Master Thesis, Addis Ababa University, Ethiopia.

Elbadawi, I. (1997). *The Impact of Regional Trade and Monetary Scheme* on Intra-Sub-Saharan African Trade.

Fikadu, M. (2012). *The Role of COMESA in Growth and Development of Ethiopia.* Unpublished Master Thesis: Addis Ababa University, Ethiopia.

Ginkel, H., Court, J., and Langenhove, L. (2003). *Integrating Africa: Perspectives on Regional Integration and Development*. Tokyo, United Nations University Press.

Greene, H. (2003). *Econometric Analysis*, fifth edition, New York: Pearson Education

Gupta, S., and Yang, Y. (2005). *Regional Trade Arrangements in Africa*: Past Performance and the Way Forward. IMF Working Paper, WP/05/36.

Haile, K., and Alemayehu, G. (2002). *Regional Economic Integration in Africa*: A Review of Problems and Prospects with a Case Study of COMESA.

Helpman, E., and Krugman, P. (1985). *Market Structure and Foreign Trade*: Increasing Returns, Imperfect Competition, and the International Economy. Cambridge, MA.

Jayasinghe, S., and Sarker, R. (2004). *Effects of Regional Trade Agreements on Trade in Agrifood Products*: Evidence from Gravity Modeling using Disaggregated Data.

Korinek, J., and Melatos, M. (2009). *Trade Impacts of Selected Regional Trade Agreements in Agriculture. OECD Trade Policy Working Papers*, No. 87, OECD.

Krueger, A.O. (1999). *Free Trade Agreements versus Customs Unions*. *Journal of* Peace: New York.

Linnemann, H. (1966). *An econometric study of international trade flows*, Amsterdam.

Lyakurwa, W., Andres M., Nehemiah N., and Walter K. (1997). *Regional Integration in Sub-Saharan Africa*: A Review of Experiences and Issues.

Mengesha, Y. N. (2009). *Trade Effects of Regional Economic Integration in Africa.*

Milner, C., and Sledziewska, K. (2005).*Capturing Regional Integration Effects in the Presence of Other Trade Shocks:* The Impact of the Europe Agreement on Poland's Imports. World Trade Net Business Briefing, Research Paper 2005/4.

Mussie, M. (2011). *The Economy Wide Impact of COMESAFTA on Ethiopia*: a Recursive Dynamic CGE Model. Unpublished Master Thesis, Addis Ababa, Ethiopia

Mutharika, B.W.T. (1972). *Towards Multinational Economic Cooperation in Africa*. New York; Praeger Publishers.

Ng'ang'a, W. (2006). *The "New" East African Community: Effects on Trade, Welfare and Productive Activities in East Africa*. Unpublished Master Thesis, University of Saskatchewan, Saskatoon, SK.

OECD. (1993). *Regional Integration and Developing Countries*, Paris.

Oguledo, V.I., and MacPhee C.R. (1994). *Gravity Models: A Reformulation and an Application to Discriminatory Trade Arrangements*. *Applied Economics*, Vol. 26, Pp. 107-120.

Oyejide, A. (2000). *Policies for Regional Integration in Africa.* Abidjan: The AfDB.

Pöyhönen, P. (1963). *A Tentative Model for the Flows of Trade between Countries*. Weltwirtschaftliches Archive, *90, 93–9.*

Pusterla, F. (2007). *Regional Integration Agreements*: Impact, Geography and Efficiency. *IDB-SOE Working Paper*, January 2007.

Rathumbu, I. (2008). *Regional Economic Integration and Economic Development in Southern Africa*, a Dissertation Paper, University Of South Africa.

Schiff, M., and Winters, A. (2003). *Regional Integration and Development*. Washington, DC: World Bank: Oxford University Press.

Schwanen, D. (1997). *Trading up*: The Impact of Increased Continental Integration on, Investment and Jobs in Canada, C.D. Howe Institute Commentary.

Tinbergen, J. (1962). *Shaping the World Economy: Suggestions for an International Economic Policy.* New York: The Twentieth Century Fund.

Umurungi, F. (2005). *A Critical Overview of Regional Trade Integration: Lessons for COMESA.* Unpublished Master Thesis, University of the Western Cape.

UNECA. (2004). *Annual Report on Integration in Africa. Addis Ababa, Ethiopia*

Viner, J. (1950). *The Customs Union Issue*. Carnegie Endowment for International Peace; New York.

Winters, A. (1996). *Regionalism versus Multilateralism*, World Bank Working Paper No.WPS, World Bank.

Appendix

.Sum

Variable	Obs	Mean	Std. Dev.	Min	Max
pairid	4446	171.5	98.73758	1	342
year	4446	2006	3.742078	2000	2012
exportofij	4445	1.14e+09	6.34e+09	0	9.13e+10
exp1	4446	1.14e+09	6.34e+09	1	9.13e+10
lnexp1	4446	15.7857	4.198738	0	25.238
gdpi	4446	5.38e+11	1.18e+12	7.85e+08	8.23e+12
lngdpi	4446	24.33474	2.529856	20.481	29.738
gdpj	4446	5.37e+11	1.18e+12	7.85e+08	8.23e+12
lngdpj	4446	24.32952	2.529099	20.481	29.738
popi	4446	1.58e+08	3.68e+08	1063715	1.35e+09
lnpopi	4446	17.20308	1.739291	13.877	21.024
distij	4446	4218.07	2809.765	136	11702
lndistij	4446	8.066984	.8313679	4.913	9.368
bordij	4446	.0874944	.2825899	0	1
langij	4446	.2309942	.4215161	0	1
comesaij	4445	.3858268	.4868447	0	1
comesa0ij	4446	.245614	.4304991	0	1

……

.tsset pairid year

panel variable: pairid (strongly balanced)

time variable: year, 2000 to 2012

delta: 1 unit

```
. xtreg lnexp1 lngdpi lngdpj lnpopi lndistij bordij langij comesaij comesa0ij,fe
Fixed-effects (within) regression               Number of obs      =      4445
Group variable: pairid                          Number of groups   =       342
R-sq:  within  = 0.1454                         Obs per group: min =        12
       between = 0.4422                                        avg =      13.0
       overall = 0.3848                                        max =        13

                                                F(5,4098)          =    139.42
corr(u_i, Xb)  = -0.5885                        Prob > F           =    0.0000
------------------------------------------------------------------------------
      lnexp1 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      lngdpi |   .7488766   .1298578     5.77   0.000     .4942847    1.003468
      lngdpj |   .6214197   .1040941     5.97   0.000     .4173387    .8255007
      lnpopi |   1.500369   .6079921     2.47   0.014     .3083743    2.692364
    lndistij |   .5746987   1.411515     0.41   0.684    -2.192637    3.342034
      bordij |   .9691451   1.861542     0.52   0.603    -2.680489    4.618779
      langij |  (dropped)
    comesaij |  (dropped)
   comesa0ij |  (dropped)
       _cons |  -48.08838   13.91812    -3.46   0.001    -75.37546    -20.8013
-------------+----------------------------------------------------------------
     sigma_u |  3.5457164
     sigma_e |  1.6950162
……
. xtreg lnexp1 lngdpi lngdpj lnpopi lndistij bordij langij comesaij comesa0ij,re

Random-effects GLS regression                   Number of obs      =      4445
Group variable: pairid                          Number of groups   =       342
R-sq:  within  = 0.1435                         Obs per group: min =        12
```

```
      between = 0.7262                        avg                 =      13.0
      overall   = 0.6226                        max                 =       13
Random effects u_i ~ Gaussian                 Wald chi2(8)        =   1591.32
corr(u_i, X)       = 0 (assumed)              Prob > chi2         =    0.0000
------------------------------------------------------------------------------
      lnexp1 |      Coef.         Std. Err.      z        P>|z|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      lngdpi |      1.134209     .0582941    19.46    0.000     1.019954    1.248463
      lngdpj |      .6638872     .0539848    12.30    0.000     .5580791    .7696954
      lnpopi |     -.0460636     .0896258    -0.51    0.607     -.221727    .1295997
    lndistij |     -1.051869     .1891598    -5.56    0.000    -1.422616   -.6811228
      bordij |      1.573284     .4618162     3.41    0.001     .6681406    2.478427
      langij |      1.396544     .3122738     4.47    0.000     .7844986    2.008589
    comesaij |      1.397314     .3516149     3.97    0.000    -.7081611   -2.086466
   comesa0ij |     -.571239      .413785    -1.38    0.167    -1.382243    .2397646
       _cons |    -18.46979     2.127229    -8.68    0.000    -22.63908   -14.30049
-------------+----------------------------------------------------------------
     sigma_u |  1.9095823
     sigma_e |  1.6950162
```

……

- **Hausman Test**

```
             ---- Coefficients ----
          |      (b)          (B)            (b-B)     sqrt(diag(V_b-V_B))
          |       fixed        random       Difference          S.E.
-------------+----------------------------------------------------------------
      lngdpi |      .7488766       1.134209      -.3853321      .1160381
      lngdpj |      .6214197       .6638872      -.0424676      .0890013
      lnpopi |      1.500369      -.0460636       1.546433      .6013498
    lndistij |      .5746987      -1.051869       1.626568      1.398782
      bordij |      .9691451       1.573284      -.6041387      1.803348
------------------------------------------------------------------------------
```

b = consistent under Ho and Ha; obtained from xtreg

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

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)

= 44.60

Prob>chi2 = 0.0000

- **Correlation**

.corr lnexp1 lngdpi lngdpj lnpopi lndistij bordij langij comesaij comesa0ij

(obs=4445)

| lnexp1 lngdpi lngdpj lnpopi lndistij bordij langij

---

lnexp1 | 1.0000

lngdpi | 0.5986 1.0000

lngdpj | 0.3685 -0.0283 1.0000

lnpopi | 0.4109 0.7554 -0.0341 1.0000

lndistij | 0.1854 0.4258 0.4286 0.3084 1.0000

bordij | 0.1258 -0.1215 -0.1206 -0.0201 -0.5184 1.0000

langij | -0.1607 -0.3555 -0.3534 -0.3181 -0.5126 0.2949 1.0000

comesaij | -0.5053 -0.4964 -0.4994 -0.3702 -0.4813 0.0080 0.4350

comesa0ij | 0.2220 0.6125 -0.3562 0.4567 0.1836 0.0156 -0.1678

| comesaij come~0ij

---

comesaij | 1.0000

comesa0ij | -0.4523 1.0000