

**THE DETERMINANTS OF BILATERAL TRADE BETWEEN AFRICAN COUNTRIES  
BASED ON REGIONAL TRADE AGREEMENTS: A GRAVITY MODEL APPROACH**

**By**

**Suara, Ajibola Emmanuel**

**THESIS**

Submitted to  
KDI School of Public Policy and Management  
in partial fulfillment of the requirements  
for the degree of

**MASTER OF DEVELOPMENT POLICY**

2016

**THE DETERMINANTS OF BILATERAL TRADE BETWEEN AFRICAN COUNTRIES  
BASED ON REGIONAL TRADE AGREEMENTS: A GRAVITY MODEL APPROACH**

**By**

**Suara, Ajibola Emmanuel**

**THESIS**

Submitted to  
KDI School of Public Policy and Management  
in partial fulfillment of the requirements  
for the degree of

**MASTER OF DEVELOPMENT POLICY**

2016

Professor Tabakis, Chrysostomos

**THE DETERMINANTS OF BILATERAL TRADE BETWEEN AFRICAN  
COUNTRIES BASED ON REGIONAL TRADE AGREEMENTS: A GRAVITY  
MODEL APPROACH**

**By**

**Suara, Ajibola Emmanuel**

**THESIS**

Submitted to  
KDI School of Public Policy and Management  
in partial fulfillment of the requirements  
for the degree of  
**MASTER OF DEVELOPMENT POLICY**

Committee in Charge:

Professor Tabakis, Chrysostomos, supervisor



.....

Professor Lee, Siwook



.....

Professor Shadikhodjaev, Sherzod



.....

2016

## ABSTRACT

Regional trade agreements are formed by nations in order to integrate their economies, liberate trade among members, and to facilitate the free movement of goods, factors of production and other resources across territorial borders based on the GATT/WTO framework. African regional trade agreements are particularly designed to foster socio-economic development and integrate African economies in to the global trading system. However, the level of trade transaction within and across regional economic communities in Africa is low when compared to other trade agreements in the world. Thus, this study aims to know the determinants of bilateral trade between countries in Africa based on regional trade agreements.

The theoretical model for the study was the gravity model which has been widely used to estimate bilateral trade flows between trading partners based on economic size, population and distance between two countries. The study made use of longitudinal research design with data obtained from the IMF direction of trade statistics, World Bank and CEPII. A total of 53,040 observations of bilateral trade flow covering 52 African countries over a period of 20 years. The data was analyzed using the STATA software statistical package.

The results of the data analysis from the pooled OLS revealed that income, population, common official language and border are all significant determinants of bilateral trade among countries. Also, the membership in RTA was found to have positively statistically significant impact on trade flows. In contrast, the fixed effects results do not show significance for some of the variables including participating in a trade agreement.

The study concluded that RTAs in Africa lacks the institutional capacity to promote international trade among its member countries. This is mainly due to the lack of complementarity in their economies and the security concerns that hinders trade flows across

border. It was recommended that countries should be encouraged to diversify their economies and broaden the trade agreements within them to allow free flow of factors of production.

**Keywords:** bilateral trade, regional trade agreement, determinants of trade, gravity model

## ACKNOWLEDGEMENT

All grace and adoration to God Almighty who has given me favor in my journey of life. I give him all thanks for the success of my program at the KDI School. I bless His holy name who all through my sojourn in South Korea was my shield, defense and the lifter up of my head. To Christ Jesus alone be all honor and glory, for his banner over me is love.

My sincere appreciation goes to the Korea Development Institute (KDI) School of Public Policy and Management for granting me a rare opportunity to fulfill a dream of post graduate study. I want to sincerely appreciate the efforts of Professor Chrysostomos Tabakis and Professor Siwook Lee who supervised this study, for their professional comments, encouragement and guidance towards the successful completion of this work. I also want to thank the faculty and staff of the KDI School for the knowledge I have been imparted with over the course of my study at the school.

My profound gratitude goes to my family and friends for their unflinching support over the years. I am particularly grateful to everyone who has in one way contributed to who I am today through words of wisdom, knowledge, moral support, and love. Finally, to all my colleagues in the Master's degree program, knowing you all has been a huge blessing to my life.

I love you all!

## TABLE OF CONTENTS

Certification	i
Abstract	ii
Acknowledgement	iv
Table of Contents	v
List of Tables	vii
List of Abbreviations	viii
Chapter One	
1.1 Background	1
1.2 Research Questions	3
1.3 Research Objectives	3
1.4 Research Hypothesis	3
1.5 Significance of the Study	4
Chapter Two	
Literature Review	5
2.1.1 Regional Trade Agreements (RTAs)	5
2.1.2 History of Regional Trade Agreements in Africa	8
2.1.3 Determinants of Bilateral Trade	10
2.1.4 Implications of Regional Trade Agreements	13
2.2 Econometric (Gravity) Model	14
Chapter Three	
Methodology	18
3.1 Research Design	18
3.2 Study Area	18
3.3 Study Population	19
3.4 Sample Size	19
3.5 Data Collection Procedure	20
3.6 Data Cleaning and Management	21

3.7	Data Analysis	22
3.8	Limitation of the Study	22
Chapter Four		
Data Analysis and Results		23
4.1	Pooled Ordinary Least Square (OLS) Method	23
4.2	Panel Data (Fixed Effect) Method	26
Chapter Five		
Summary, Recommendation and Conclusion		30
5.1	Summary of Findings	30
5.2	Conclusion	31
5.3	Recommendation	32
References		33

## LIST OF TABLES

Table 3.1	Eight Core Regional Economic Communities (RECs) in Africa	20
Table 4.1	Results of the Pooled Ordinary Least Square Method	24
Table 4.2	Results of the Panel Data (Fixed Effect) Method	28

## LIST OF ABBREVIATIONS

AEC	African Economic Community
AMU	Arab Maghreb Union
AU	African Union
CENSAD	the Community of Sahel-Saharan States
COMESA	Common Market for Eastern and Southern Africa
CU	Customs Union
EAC	East African Community
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
FTA	Free Trade Agreement
GATT	General Agreements on Tariffs and Trade
GDP	Gross Domestic Product
IMF	International Monetary Fund
NAFTA	North American Free Trade Area
OLS	Ordinary Least Square
REC	Regional Economic Community
RTA	Regional Trade Agreement
SADC	Southern African Development Community
UNCTAD	United Nations Conference on Trade and Development
UNECA	United Nations Economic Commission for Africa
WTO	World Trade Organization

## CHAPTER ONE

### INTRODUCTION

#### 1.1 BACKGROUND

Regional (preferential) trade agreements are actions of governments to liberalize trade and integrate their economies on regional basis, sometimes through free trade areas or customs union. These regional agreements are in line with the World Trade Organization's (WTO) stipulations, through its Article XXIV of General Agreements on Tariffs and Trade (GATT), which allows countries to enter into preferential/regional agreements with one another. This provision allows countries to enter into regional agreements by substantially liberalizing trade between them and do so by not raising trade barriers to countries that are not signatories to the agreement.

Historically, preferential trade agreements have been around for centuries, usually as commercial treaties among empires and agreements within colonial relationships. However, the creation of the GATT in 1947, by 23 countries, allowed for a multilateral trade agreement in the forefront of international trade relations. This was subsequently followed by the establishment of the European Economic Community (EEC), now EU, in 1957 by the signing of a treaty in Rome. This agreement sought to bring about economic integration among the six European founding members. Adam and Chaudhry (2013) opined that the birth of the EEC has led to “a renewed wave of proliferation of economic-integration arrangements”.

Ever since, there have been several trade agreements that have been notified to the WTO. As Romalis (2002) pointed out that “there are over 200 preferential trade agreements currently in force, and while almost every country is a party to at least one such agreement perhaps a more

important fact is that typically 200 countries are not parties to each agreement”. As at 7<sup>th</sup> April 2015, the WTO has reported that a total of 612 RTA notifications had been received by the GATT/WTO, however, 406 of these notifications are in force. The increase and spread of these regional agreements are meant to reduce existing trade barriers among the member countries by promoting economic integration among them. “It is therefore unsurprising that trade facilitation and trade cost reduction programs or targets form important component of bilateral or regional trade and economic integration initiatives” (Ackah, Turkson and Opoku, 2013).

The continent of Africa has also being impacted upon by the proliferation of preferential trade agreements. The formation of the Organization of African Unity (OAU), now African Union, in 1963 by 32 independent African states was the first effort on the continent at regional cooperation and economic integration. This was followed by the establishment of the Economic Community of West African States (ECOWAS) in 1975 as the premier regional economic community on the continent; post-independence. Ever since, the continent is now home to some 30 regional trade blocs, many of which are instituted for deeper regional integration schemes.

These agreements are generally referred to as Regional Economic Communities (RECs). This was mainly as a result of the commitments in the Lagos Plan of Action and Final Act of Lagos, in 1980, and subsequent signing of the Abuja treaty in 1991 establishing the African Economic Community so as to foster the socio-economic and cultural integration of the countries in the continent. However, eight of these RECs are most important and considered to be the building blocks of the African Economic Community. These are namely Arab Maghreb Union (AMU), the Community of Sahel-Saharan States (CEN-SAD), Common Market for Eastern and Southern Africa (COMESA), East Africa Community (EAC), Economic Community of Central African States (ECCAS), Economic Community of West African States (ECOWAS),

Intergovernmental Authority on Development (IGAD), and Southern African Development Community (SADC).

The RTAs are expected to facilitate the easiness of trade and investment relations among member countries, through the removal of tariffs and reduction of non-tariff trade barriers. According to the Indian national center for trade information, the level of intra-regional trade (bilateral trade) has improved over the years. There has been a huge enhancement of trade within regional blocs, for example, exports among SADC member countries increased from US\$617million in 1980 to US\$6.3billion in 2005, representing 7.7 percent of the total exports within the region. Intra-exports within ECOWAS accounted for 9.5 percent of the total exports in 2005. However, the level of trade transaction within and across regional blocs is still low compared to other regional/preferential agreements in the world.

The objective of this study is to evaluate the determinants of bilateral trade flows among the different nations that are involved in regional trade agreements in Africa and particularly, the effects of the regional economic communities in inter-regional trade among the countries.

## 1.2 RESEARCH QUESTIONS

- ❖ What are the determinants of bilateral trade flows between countries in Africa?
- ❖ What is the effect of preferential trade agreements in facilitating bilateral trade in Africa?

## 1.3 RESEARCH OBJECTIVES

- ❖ To know the determinants of bilateral trade flow between countries in Africa
- ❖ To know the effect of RTA/REC in facilitating bilateral trade in Africa

## 1.4 RESEARCH HYPOTHESIS

- ❖  $H_0$  : The coefficients of all the independent variables are equal to zero
- ❖  $H_1$  : At least one of the coefficients of the independent variables is not equal to zero
- ❖  $H_0$  : RTAs has no impact on trade flow between African countries
- ❖  $H_2$  : RTAs has impact on trade flow between African countries

## 1.5 SIGNIFICANCE OF THE STUDY

The significance of this study rest on the agenda of African leaders when they signed the treaty establishing the African economic community. The mission to establish a continental free trade area (CFTA), incorporating all the countries on the continent justifies the objectives of this study. By determining the factors that contribute to trade flows between trading partners will help formulate policies and promote the adequate implementation of those policies. More importantly, the significance of regional economic communities in facilitation of trade relations will help promote ways to achieve the socio-economic integration of the continent and further integration in to the global trading system. In addition, the existing quantitative literatures on inter-regional trade agreements are not those solely focused on bilateral trade among African countries. Thus, this study represents the first known to the author to be done in Africa.

## CHAPTER TWO

### LITERATURE REVIEW

This chapter focuses on related studies that have been carried out on the determinants of bilateral trade flows among countries. The review of literatures in this study helps to ascertain the present state of knowledge especially in respect to the stated objectives. Also, the latter part of this chapter contains the econometric model used for this study.

#### 2.1.1 REGIONAL TRADE AGREEMENTS (RTAs)

The commitment of world leaders to increase cooperation, economic integration and development of people and nations resulted in the negotiations among United Nations member countries which brought about the international trade agreement for the reduction of tariffs on trade in goods and sought the removal of non-tariff barriers through subsequent negotiations. The agreement reached in 1947 created the General Agreements on Tariffs and Trade (GATT). The provisions of the GATT, specifically Article XXIV, made it available for nations to enter into bilateral or regional trade agreements. Bilateral agreements are made between two nations, whereas, regional trade agreements are generally entered into by more than two countries in a particular geographical region.

Brownsell (2012) pointed out that “a bilateral or regional trade agreement is an agreement entered into between two or more countries under which the participants agree to reduce tariffs, quotas and other restrictions on trade between them”. These agreement ranges from agreements on trade on goods, services, protection of intellectual property, free movement of people and resources, among others. Meyer, Fenyes, Breitenbach and Idsarch (2010) observed that regional trade agreements present opportunities for controlling and reducing non-tariff trade

barriers that are of greater concern to producers and governments because of its tendency to increase transaction costs.

In his book, *Advanced International Trade: theory and practice*, Robert Feenstra (2004) defined regional agreement or preferential agreement as “instances where a group of countries will decide to completely eliminate all tariffs between them, without eliminating tariffs on goods imported from the rest of the world”. He further stated that in cases where this group of countries also unify their tariffs against the rest of the world such that there exist zero tariffs internally among them, it is called a customs union; for example MERCOSUR. However, when the group of countries operate with zero tariff internally and maintain individual country’s tariffs against the rest of the world, therefore, the arrangement is referred to as free trade area, examples are NAFTA, KORUSFTA etc.

Furthermore, Article XXIV paragraph 8 of the Generalized Agreement on Tariff and Trade (GATT) express that when two or more customs territories unifies into one single customs territory, the said arrangement is understood to mean a Customs Union. It further states that

- (i) “Duties and other restrictive regulations of commerce (except, where necessary, those permitted under Articles XI, XII, XIII, XIV, XV and XX) are eliminated with respect to substantially all trade between the constituent territories of the union or at least with respect to substantially all the trade in products originating in such territories, and,
- (ii) Subject to provisions of paragraph 9, substantially the same duties and other regulations of commerce are applied by each of the members of the union to the trade of the territories not included in the union”;

(b) “A free trade area shall be understood to mean a group of two or more customs territories in which the duties and other restrictive regulations of commerce (except, where necessary, those permitted under Articles XI, XII, XIII, XIV, XV and XX) are eliminated on substantially all the trade between the constituent territories in products originating in such territories”.

In addition, Omilola (2011) opined that free trade areas are agreements whereby member countries to the agreement eliminate among themselves all existing trade barriers while each country maintains its tariffs against countries that are not part of the agreement. Whereas customs union pertains to the removal of intra-trade barriers, including tariffs, among the member countries, and their unified external tariffs are imposed on imports from non-member countries. More so, it is necessary to note that there are different types of regional trading agreements based on their different level of economic integration identified among member countries. In view of this, Omilola further highlighted three types of RTAs in addition to FTA and CU.

- i. Common Market is a deeper level of economic integration above the customs union which allows for the movement of factors of production without hindrance across borders of member countries.
- ii. Economic Union allows for the agreement of member countries on the coordination and harmonization of economic policies and initiatives of fiscal monetary, welfare and trade within a common market area.
- iii. Political Union entails the unification of all socio-economic and political policies among member nations.

These forms of regional agreements are birthed out of the different reasons and circumstances why nations negotiate with one another. This is further stressed by Whalley (1998) that regional trade agreements are negotiated in order to provide underpinnings to strategic alliances (European Union, EU) that is, forming a sort of security arrangements or “a way of obtaining more security, by smaller countries, for their access to larger country markets (Canada United States Free Trade Agreement, CUSFTA)”. Other agreements “help lock in domestic policy reform and make it more difficult to subsequently reverse” (Mexico in the North American Free Trade Agreement, NAFTA); while some others are forged to foster economic, social and cultural integration as in those agreements observed in Africa.

#### 2.1.2 HISTORY OF REGIONAL TRADE AGREEMENTS IN AFRICA

Regional agreements began among African nations with the establishment of the Organization of African Unity (OAU) on 25<sup>th</sup> may 1963. This represents the very first effort in Africa at economic integration, socio-cultural alliance, infrastructure development, and issues related to independence from colonization as well as security. As Victor Essien (2006) posited that regional integration in Africa “was seen as an extention of the liberation movements and an effort to construct geographic entities that were economically viable and politically united”. This effort was further strengthened in 1980 with the commitments by African leaders at the Extraordinary Summit of the Plan and the Final Act of Lagos.

The signing of the Abuja Treaty in 1991 translated the commitments made in the Lagos Plan of Action and the Final Act of Lagos into the establishment of the African Economic Community (AEC). According to the Abuja Treaty, the AEC was established “to foster the economic, social and cultural integration of the continent”. This was agreed on in order to promote deeper economic cooperation so as to achieve a balanced development in all parts of the

continent. The United Nations Economic Commission for Africa (UNECA) noted that the Constitutive Act of the African Union was in “conformity with the ultimate objectives of the OAU Charter and the provisions of the Abuja AEC Treaty”.

Thus, the 36<sup>th</sup> Ordinary Session of the Assembly of Heads of States in Lome, Togo, in July 2000, gave rise to the establishment of the African Union (AU) through the transitioning of the OAU into AU in 2001. Ever since, there have been several regional cooperation and agreements in Africa geared towards socio-economic development, facilitation of intra and inter regional trade in goods and services, alliances in security, democracy, agricultural development, cultural integration, free movement of labor and resources (Omilola,2009; Chiumya, 2009; Kone, 2010; Adam & Chaudhry, 2013). Such agreements include New Partnership for African Development (NEPAD), African Peer Review Mechanism (APRM) etc.

In addition to the continental wide initiatives, there have been several regional agreements across the different regional groupings in Africa established to foster development by unlocking the potentials of the countries involved in the agreement through cooperation and trade. For instance, the Economic Community of West African States (ECOWAS) was established in 1975 to encourage interstate economic and political cooperation using various economic policies. Thereafter, there have been other RTAs established in Africa, for example, COMESA, SADC, ECCAS etc. these regional trade agreements in Africa are generally referred to as Regional Economic Community (REC). In all, about 13 RECs exist in Africa, however, eight of the RECs are considered most important for the implementation of the African Economic community. This was reiterated, according to UNECA, in the decision made by African leaders Assembly in 2012 through the “Assembly/AU/Dec. 394 (XVIII) to establish a Pan-African Continental Free Trade Area (CFTA) by the indicative date of 2017”.

These eight RECs are the Arab Maghreb Union (AMU) established in 1989; the Community of Sahel-Saharan States (CEN-SAD); Common Market for Eastern and Southern Africa (COMESA) which in 1994 replaced the Preferential Trade Agreement (PTA) that was established in 1981, East Africa Community (EAC) was established in 2000; Economic Community of Central African States (ECCAS) established in 1983; Economic Community of West African States (ECOWAS) established in 1975; Intergovernmental Authority on Development (IGAD) replaced the Intergovernmental Authority on Drought and Development (1986), in 1996; and Southern African Development Community (SADC) which was transformed in 1992 from Southern African Development Coordination Conference (SADCC).

### 2.1.3 DETERMINANTS OF BILATERAL TRADE

A high number of factors have been identified for easiness and determinants of trade among nations. These factors might be reasons why nations cooperate and integrate their economies based on regional agreements to begin with. Several literatures have identified numerous variables that facilitates trade relations among nations. In a study of the potential trade in south-east Europe: a gravity model approach, Edward Christie (2002) concluded that the GDP of the trading countries as well as the distance between them are highly significant with their respective expected signs, and they are of reasonable magnitude in determining trade. Also, Martinez-Zarzoso (2003) agreed with Christie in her work on gravity model's application to trade among 47 countries based on regional blocs. She noted the significance of the GDPs of both trading countries. The distance coefficient in the gravity model equation is also significant and carry the expected negative sign.

Moreover, the language dummy showed significance and positive for all the years studied. Christie further noted that trade facilitation is high among western countries indicated by its

significant impacts among members of the EU and OECD, and also bilateral trade between English-speaking countries. In other words, regional agreements and language help to improve trade among countries. However, he noted the insignificant effect of both German and French languages. Jin, Koo and Sul (2006) in the study of the effects of the free trade agreement among China, Japan and South Korea observed that the countries trade with one another based on their resource endowments. Thus, these countries tend to specialize based on this. Nevertheless, “there exists a significant amount of intra-industry trade among the member nations in all sectors except agricultural and service/utility sectors”.

In order to determine whether the GATT/WTO has increased trade, Rose (2004) in a study of panel dataset covering over fifty years and 175 countries observed that the “gravity effects are not only large but economically sensible in size, highly statistically significant”, especially revealing that the farther apart countries are from one another the less the trade between them, and it found out that economically larger and richer economies trade more than smaller ones. The study also revealed that countries in the same regional trade agreements trade more, and so do those with common language and land border. However, he concluded that membership in the GATT/WTO have no substantial effect on trade.

Furthermore, the complementarity between economies of trading partners has been identified as determining bilateral trade. Cooper and Manyin (2011) put forward this point in their work on looking ahead to the prospects and potential challenges of the United States-South Korea free trade agreement. They highlighted the heavy dependence of the South Korean economy on imported agricultural products and the endowment of the United States with arable land. Other factors noted on their complementarity includes “the orientation of U.S. and South Korean economies and policies over the decades”. This is in addition to the political, economic

and commercial factors, as well as the national security interests of both countries, which have driven the economic relationship between them, and has been largely attributed to the experiences of the Korean conflict and security concerns in East Asia.

Common currency within regional agreement has also been observed to determine bilateral trade in some instances, as noted by Adam and Chaudhry (2013). Significant positive effect of currency union was evidenced on aggregate intra-ECOWAS trade. Decrease in formal trade barriers through the efficiency of customs, improvements in the exporting country's logistics performance have been identified to increase trade among nations (Felipe and Kumar, 2010). Nevertheless, despite the existence of multiple regional agreements in Africa, the level of intra-Africa trade is still below its actual potential. The United Nations Conference on Trade and Development (UNCTAD) policy brief in 2015 noted that the low rate of implementation of RTAs has made it challenging for African countries to benefit and exploit the potential gain of regional trade for development. Moreover, lack of complementarities among partners, diminishing returns to the exploitation of resources has inhibited responses to market-integration-oriented regional policies and the resultant implications of the RTA whether it is trade-creating or trade-diverting (Melo and Tsikata, 2014; Chiumya, 2009). To put it succinctly, membership in a trade agreements revealed mixed results.

#### 2.1.4 IMPLICATIONS OF REGIONAL TRADE AGREEMENTS

The effect of RTA can be either positive or negative on trade, largely depending on the design and implementation of the agreement by the member countries. Often times, empirical studies encounter challenges in identifying the effect of regional or preferential agreements on trade especially when viewed from the general equilibrium perspective. Nevertheless, partial analysis of aggregate trade volume offer some comfort in ascertaining the effect of regional

agreements on international trade. One of the ways to assess this is to examine the changes that resulted as a consequence of the enforcement of the RTA.

The study on the impact of NAFTA on international trade by John Romalis (2004) observed that “since the advent of NAFTA, one of the more striking occurrences has been the rapid increase in Mexican trade. Mexico has become the US’s second largest trading partner, accounting for 11.5 percent of US merchandise imports in 2001 and 13.9 percent of US exports, up from 6.9 and 9.0 percent respectively in 1993. Only Canada is a partner for more US trade. Mexico now accounts for a larger share of US trade than Korea, Thailand, Singapore, Malaysia, Hong Kong and Taiwan combined”. Helliwell, Lee and Messinger (1999) in the study examining the effects of the Canada-United States FTA on interprovincial trade noted that the agreement on tariff reduction, created more trade between the two countries, but evidence of trade diversion was observed among the interprovincial channels.

Khoso, Ram, Shah, Shafiq and Shaikh (2011) put forward that SAFTA’s (South Asia Free Trade Agreement) effect on the Pakistani economy would be net export benefit with the expansion in demand of consumer items highlighted by the increase in production in many downstream industries, increased consumer surplus, and good multiplier effect on the economy as a whole. Ackah, Turkson and Opoku (2013) posited that the promotion on intra-ECOWAS trade in export of manufactures has had a positive impact as a result of the regional trade integration effort by lowering trade cost among the members. Adam and Chaudhry (2013) further found significance of positive effect of the currency union in West Africa on the aggregate intra-ECOWAS trade, though, “some individual members respond negative to the currency union”.

However, despite the positive effects of RTAs highlighted above, Omilola concluded “that African RTAs have not met most desired conditions required for successful RTAs”. This was also reiterated by Meyer, Fenyes, Breitenbach and Idsardi that only one of the 8 agreements identified as the most important RECs refers explicitly to the WTO’s technical barrier to trade, thereby hampering investment in institutional infrastructure needed for business and trade. In addition, Melo and Tsikata identified the shortcoming of the linear model of integration adopted by African RECs as behind the border measures aimed at reducing trade cost were being ignored by African RECs until recently. Omilola’s concluding remarks sums up the status of RECs on the continent today, despite the economic inefficiencies of the trade agreements, RTAs in Africa are maintained because they are regarded as important to the integration of the continent’s economies into the global markets and inclusion in the overall trade policy environment of the global economy.

## 2.2 ECONOMETRIC (GRAVITY) MODEL

The gravity model of trade in international economics is used to estimate bilateral trade flows between two trading nations based on economic sizes and distance between the two countries. The gravity model is compared to Newton’s law of gravity in mechanics; the gravity pull between two physical objects is proportional to the product of the body mass of each object divided by the square of the distance in between the center of gravity of each object. Christie (2002) opined that the analogy for trade is as follows; the bilateral trade flow between two countries is proportional to the product of each country’s economic mass, generally measured by gross domestic product (GDP), each to the power of quantities to be determined, divided by the distance between the countries respective economic centers of gravity, generally represented by their capitals, raised to the power of another quantity to be determined.

The gravity trade model has been used extensively in literature on international trade (Anderson and Wincoop, 2001; Bergstrand, 1985; Martinez-Zarzoso, 2003). For the purpose of this study of the determinants of bilateral trade among countries in African region, the gravity trade model as applied by Martinez-Zarzoso to trade between regional blocs will be utilized. The volume of exports from country  $i$  to country  $j$ ,  $X_{ij}$ , is a function of incomes (GDPs) of country  $i$  and country  $j$ , their respective population, the geographical distance between them, and a set of dummy variables.

$$X_{ij} = \beta_0 Y_i^{\beta_1} Y_j^{\beta_2} N_i^{\beta_3} N_j^{\beta_4} D_{ij}^{\beta_5} A_{ij}^{\beta_6} u_{ij} \quad (1)$$

Where,

$X_{ij}$  is the volume of exports from country  $i$  to country  $j$ ,  $Y_i$  and  $Y_j$  represents the GDPs of the exporter and importer,  $N_i$  and  $N_j$  represents the respective population for the exporting and importing countries,  $D_{ij}$  is a measure of the geographical distance between the two countries and  $A_{ij}$  represents other factors that aid or prevent bilateral trade pairs of countries.  $u_{ij}$  stands for the error term. Martinez-Zarzoso put forward an alternative formula for (1) that uses per capita income instead of population.

$$X_{ij} = \gamma_0 Y_i^{\gamma_1} Y_j^{\gamma_2} YH_i^{\gamma_3} YH_j^{\gamma_4} D_{ij}^{\gamma_5} A_{ij}^{\gamma_6} u_{ij} \quad (2)$$

Where,

$YH_i$  ( $YH_j$ ) denotes GDP per capita of the exporting (importing) nation. She noted that the two equations are equivalent and the coefficients are expressed as:  $\beta_3 = -\gamma_3$ ;  $\beta_4 = -\gamma_4$ ;  $\beta_1 = \gamma_1 + \gamma_3$ ;  $\beta_2 = \gamma_2 + \gamma_4$ . However, the second equation is used when gravity model is applied to predict bilateral trade for specific products.

Therefore, equation (1) will be adopted for the purpose of this study. In order to estimate the bilateral trade among African countries, equation (1) is presented in log-linear form.

$$\ln X_{ij} = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln Y_j + \beta_3 \ln N_i + \beta_4 \ln N_j + \beta_5 \ln D_{ij} + \beta_6 \ln RTA_{ij} + \beta_7 \text{comlang\_off}_{ij} + \beta_8 \text{contig}_{ij} + \beta_9 L_i + \beta_{10} L_j + \beta_{11} N_i * L_i + \beta_{12} N_j * L_j + u_{ij} \quad (3)$$

Where,

$\ln$  denotes variables in natural logs, and independent variables 6,7 &8 takes the value of one when a certain condition is satisfied, for example, having the same official language and land border, zero otherwise. The RTA variable evaluate the effects of the regional (preferential) trading agreements. Comlang\_off denotes common official language, contig denotes contiguity,  $L_i$  ( $L_j$ ) denotes the land area of exporting (importing) country, and  $N_i * L_i$  ( $N_j * L_j$ ) denotes the interaction term between population and land area of both countries.  $\beta_6$  measures the impact of membership in regional trade agreement on exports.

The coefficient  $\beta_1$ , for the GDP of exporting country is expected to be positive because a high level of income will infer a high level of production within the country and subsequently a higher amount of goods available for export. The coefficient for importing country,  $\beta_2$ , is also expected to be positive because a higher level of income will signify that the importing country will be able to afford and import more goods. The coefficients for the population of both countries,  $\beta_3$  and  $\beta_4$ , may be positive or negative. The outcome depends on whether the exporting country is big and exports less (absorption effect) or the big country exports more than a small country (economies of scale). The same reason applies to importing country. The distance coefficient is expected to be negative because it serves as proxy of all possible costs associated with trade between countries  $i$  and  $j$ .

The list of dummy variables will comprise of common official language, contiguity, and membership of Regional Economic Community (REC). The variables common official language and contiguity will be used to control for the other potential reasons that might influence trade. The membership of REC variable will be crucial to determine whether being a member of any particular RTA influence trade as well.

## CHAPTER THREE

### METHODOLOGY

This chapter entails the methodology used in this research study. It highlights the various steps that were successfully followed to ensure the reliability and validity of the study.

#### 3.1 RESEARCH DESIGN

The research questions for this study are meant to show the determinants of bilateral trade across countries in Africa conditioned on their membership in the eight identified regional economic community that have been identified as important for the promotion and realization of the African Economic Community. Therefore, this study is an inferential study utilizing a longitudinal research design. The study is longitudinal because the data structure for the study is a panel data of observations for the countries over many years. These include the bilateral trade between two countries over several years as well as the value of their gross domestic products and population over the same period.

#### 3.2 STUDY AREA

The study area covers the entire continent of Africa including its several islands such as Madagascar, Mauritius, Seychelles, Comoros, Cape Verde and Sao Tome & Principe. Africa is the second largest continent in the world with its land area covering 30.2million kilometer square. The equator divided the continent into two equal halves and most parts of it is situated in the tropical belt. It also has the world's largest desert (Sahara desert) which covers most part of the Northern part of the land area. Its population size is more than one billion people which represents the second most populated continent in the world.

The continent is home to huge reserves of different kinds of natural resources which includes crude oil, natural gas, diamonds, gold, manganese, bauxite, copper, iron ore etc. the existence of these natural resources on its land area and waters makes it one of the world's concentrated resource rich places.

### 3.3 STUDY POPULATION

The study population includes all the 54 countries in Africa except for Somalia and South Sudan. The exclusion of these two countries are as a result of lack of sufficient data for Somalia covering the study period of 1995 – 2014 and South Sudan is a relatively new nation that was carved out of Sudan in 2007. Thus, the unavailability of data for South Sudan prior to 2007 qualifies for exclusion from the study. Both Somalia and South Sudan are likely to create a large outlier in the regression model thereby breaking one of the important assumptions for the unbiasedness estimator of the least squares principle.

### 3.4 SAMPLE SIZE

A sample is a representative part of the population of interest in the research study. The sample for this study entails 52 African countries with data collected from different sources over the period of 20 years, that is, from 1995 – 2014. Therefore, since this study utilized panel data for the econometric (gravity) model, the number of observations for the study is the bilateral trade flows between the countries for the 20 year period. Mathematically, it can be written as  $52 \text{ countries} * 51 \text{ countries} * 20 \text{ years} = 53,040$  observations.

Table 3.1 Eight Core Regional Economic Communities (RECs) in Africa

<b>Regional Economic Communities RECs</b>	<b>Member States</b>	<b>Year</b>	<b>Type</b>
Arab Maghreb Union (AMU)	Algeria, Libya, Mauritania, morocco, and Tunisia.	1989	Economic Union
The Community of Sahel-Saharan States (CENSAD)	Benin, Burkina Faso, Central African Republic, Chad, Comoros, Cote D'Ivoire, Djibouti, Egypt, Eritrea, Gambia, Ghana, Guinea, Guinea Bissau, Kenya, Liberia, Libya, Mali, Mauritania, Morocco, Niger, Nigeria, Saotome & Principe, Senegal, Sierra Leone, Somalia, Sudan, Togo, Tunisia.	1998	Free Trade Agreement
Common Market for Eastern and Southern Africa (COMESA)	Burundi, Comoros, Congo D.R., Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Libya, Madagascar, Malawi, Mauritius, Rwanda, Seychelles, Sudan, Swaziland, Uganda, Zambia, and Zimbabwe	1994	Custom Union
East Africa Community (EAC)	Burundi, Kenya, Rwanda, Tanzania, and Uganda.	2000	Custom Union
Economic Community of Central African States (ECCAS)	Angola, Burundi, Cameroon, Central African Republic, Chad, Congo, Congo D.R. Equatorial Guinea, Gabon, and Saotome & Principe	1983	Economic Union
Economic Community of West African States (ECOWAS)	Benin, Burkina Faso, Cape Verde, Cote D'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.	1975	Custom Union
Intergovernmental Authority on Development (IGAD)	Djibouti, Eritrea, Ethiopia, Kenya, Somalia, Sudan, and Uganda.	1996	Economic Union
Southern African Development Community (SADC)	Angola, Botswana, Congo D.R., Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania, Zambia, and Zimbabwe	1992	Custom Union

Source: Author's construction

### 3.5 DATA COLLECTION PROCEDURE

This study is a quantitative method research, which utilized secondary data on the countries observed. The panel data used in this study was downloaded from the French research

center which focuses on international economics; Centre d'Etudes Prospectives et d'Informations Internationales (CEPII). The CEPII gravity dataset for all world pairs of countries was primarily generated by Head, Mayes and Ries (2000) for the study on “the erosion of colonial trade linkages after independence”. The dataset for world pairs for all countries was for the period 1948 -2006. Other sources of data for this study was from the World Bank development indicators and International Monetary Fund (IMF) direction of trade statistics.

### 3.6 DATA CLEANING AND MANAGEMENT

The data collected from the various sources were cleaned in order to ensure consistency in the data structure. Due to the inconsistency observed between the CEPII dataset and World Bank development indicators, the population and GDP variable were dropped in the CEPII dataset and replaced with the World Bank development indicators. In addition, the study was only able to extract 12 year period from CEPII dataset, out of the 20 year period that the study panel data covers. The eight year deficit (2007 – 2014) was constructed by the author and augmented values obtained from the World Bank data, where necessary. The left-hand variable, that is, the bilateral trade between two countries measured by the volume of exports from country *i* to country *j*, that is, exporter country to importer country, was obtained from the IMF direction of trade statistics for the entire 20 year period.

Furthermore, the study dataset was properly preserved and stored in order to ensure the reliability of the results that was generated. This was done so that the study data and results will remain accurate, authentic, reliable and complete. Also, it ensures that the data keep its integrity and results may be replicated.

### 3.7 DATA ANALYSIS

The panel data for the 52 countries covering all 53,040 observations was processed and analyzed using the STATA data analysis and statistical software package. Two statistical methods were employed for the purpose of this study, they are pooled ordinary least square (OLS) and the panel data (fixed effect). The dataset was analyzed based on the two objectives of the study.

### 3.8 LIMITATION OF THE STUDY

There were several limitations that were encountered in the process of carrying out this study. First, despite the widespread use of the gravity model equation, the lack of its usage in research studies still exists on trade flows within inter-regional blocs in Africa. Another limitation is that some of the regional agreements were not in force for some part of the period of the study, thereby not having the necessary impact on trade flows.

Furthermore, the lack of sufficient data on trade flows among African countries persists especially on prominent trade database organizations such as the United Nations COMTRADE, UNCTAD, WTO etc. Although, the dependent variable for this study was downloaded from the International Monetary Fund direction of trade statistics, there is lack of reporting of trade data by some African countries such as Botswana, Burundi, and Eritrea. In addition, there were several observations in the dataset where the trade flow between two partners is zero. The sum of the observations of zero volume trade flow and non-reported value was more than half of the data. Thereby reducing the number of observations utilized for the analysis, and might affect the statistical power of the results.

## CHAPTER FOUR

### DATA ANALYSIS AND RESULTS

This chapter is designed to present the analysis of data on the impact of regional trade agreements on bilateral trade in Africa using the gravity model approach. In other words, it presents the results of the data gathered for the determinants of bilateral trade in this study. The chapter is divided into two sections, the first section presents the result of the data analysis using pooled OLS (ordinary least square) method, and the other section presents the result using panel data (fixed effect) method.

#### 4.1 POOLED ORDINARY LEAST SQUARE (OLS) METHOD

Ordinary least squares regression was utilized to analyze the dataset based on the gravity model equation discussed earlier. The data analysis result presented in Table 4.1 revealed that the estimated coefficients for the observations of the value of exports that were reported by countries in the data sample are statistically significant. The exporter country's GDP is significant and positive in all the columns. Also, the GDP of the importer country is statistically significant in all the six columns and carried the expected positive sign. The sign of the coefficients, though significant, of both the importer and exporter countries' population, is ambiguous in the results presented in the table. The population of the exporter country's effect on exports in columns 1 and 2 signifies the absorption effect showing that the country exports less as it gets bigger. Columns 3, 4 and 5 showed the importance of economies of scale, due to the positive sign of the coefficients, and the market size of the country.

Table 4.1 Results of the Pooled Ordinary Least Square Method

VARIABLES	(1) Export	(2) Export	(3) Export	(4) Export	(5) Export	(6) Export
Exporter GDP	1.10*** (0.02)	1.09*** (0.02)	1.08*** (0.02)	1.13*** (0.02)	1.10*** (0.02)	1.15*** (0.02)
Importer GDP	0.55*** (0.02)	0.53*** (0.02)	0.54*** (0.02)	0.52*** (0.02)	0.54*** (0.02)	0.57*** (0.02)
Exporter Pop.	-0.13*** (0.02)	-0.12*** (0.02)	0.09*** (0.03)	0.71*** (0.08)	0.30*** (0.04)	
Importer Pop.	0.05** (0.02)	0.05*** (0.02)	0.14*** (0.02)	-0.20*** (0.07)	0.18*** (0.03)	
Distance	-1.77*** (0.03)	-1.48*** (0.03)	-1.50*** (0.03)	-1.49*** (0.03)	-1.49*** (0.03)	-1.49*** (0.03)
RTA	0.75*** (0.05)	0.76*** (0.05)	0.64*** (0.05)	0.66*** (0.05)	0.65*** (0.05)	0.71*** (0.05)
Common Official language		0.66*** (0.04)	0.62*** (0.04)	0.62*** (0.04)	0.61*** (0.04)	0.61*** (0.04)
Contiguity		0.96*** (0.06)	1.11*** (0.06)	1.12*** (0.06)	1.12*** (0.06)	1.06*** (0.06)
Exporter Area			-0.22*** (0.02)	0.55*** (0.09)		
Importer Area			-0.09*** (0.01)	-0.50*** (0.09)		
Exporter Population*Area				-0.05*** (0.01)	-0.02*** (0.00)	-0.01*** (0.00)
Importer Population*Area				0.03*** (0.01)	-0.01*** (0.00)	-0.00 (0.00)
Observations	23,302	23,302	23,302	23,302	23,302	23,302
R-squared	0.37	0.39	0.39	0.40	0.39	0.39

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Same explanation applies to the effect of the exporter country's land area on exports when it is included in the gravity equation. The result further showed the impact of land area of the exporter and importer countries on trade that smaller landed area countries benefit more from trade, but in column 4, exporter country's land area coefficient revealed that bigger countries

exports more. In addition, the explanation for the exporter country's population and land area also applies to importer country's population and land area effect on trade.

The effect of the geographical distance between two countries bilateral trade is negative. The expected sign indicates that as the distances between two countries increase by 1, the trade volume decreases by 1.5 percentage points on average as observed in all the six columns. Distance stands as a proxy for trade cost, therefore, an increase in trade cost is bound to reduce trade volume. The common official language between two trading countries impacts trade positively. The border effect is also significant. Both variable carry the expected positive sign. In addition, the interaction effect of the population and land area of any country (importer or exporter) on bilateral trade flows was significant in all but one of the coefficients. The effect of the interaction term of population and land area on bilateral trade in the equation reduces the impact of population of the exporter on trade and also for the importer, except in column 4 where the interaction term reduces the negative impact of the importing country's population on bilateral trade. Nevertheless, the ambiguity which is attached with size effect on trade also occurred on the interaction term.

The statistical significance of the variables included in the gravity equation shows that all the variables are important determinants of bilateral trade. Therefore, the null hypothesis ( $H_0$ ) for the first research question is rejected. This result is consistent with existing literatures, as Martinez-Zarzoso reported in the study of trade between regional blocs that determinants of bilateral trade flows such as income level, population, geographic proximity and cultural similarities, for example language, have relevance in the gravity equation model of trade among countries. Felipe and Kumar (2010) also reported similar results where they found out that trade in Central Asia increases by 1.5 percent with a 1 percent decrease in distance between trading

partners. They also reported the statistical significance of GDP, GDP per capita and size of the trading partners to positively impact trade.

The effect of the inter-regional trade agreements (regional economic communities) on bilateral trade in Africa is positively statistically significant at the 99 percent confidence level. The result of the pooled OLS on the dataset sample between African countries revealed that regional economic communities do have a statistical significant impact on trade flows among nations in Africa. Therefore, the null hypothesis ( $H_0$ ) for the second research question in this study is rejected. This means that RECs do have impact on bilateral trade flows between African countries.

The impact of RTA on international trade as reported above is consistent with previous studies. For instance, the study of the effects of the Canada-United States FTA on trade, Helliwell, Lee and Messinger reported that the FTA increased trade flows between Canada and the United States, though evidence of interprovincial trade diversion exist. Romalis also reported that NAFTA and CUSFTA have had a substantial impact on international trade volumes, but a modest effect on prices and welfare. Ackah, Turkson and Opoku also reported that the positive impact of the regional trade integration efforts in West Africa has reduced the trade cost among members.

#### 4.2 PANEL DATA (FIXED EFFECT) METHOD

The results of the Pooled OLS presented in the previous section might suffer from bias, that is, the results in Table 1 is likely to be suffering from omitted variable bias. The omitted variables can cause endogeneity bias as they might be important determinant of both the bilateral trade and the existence of an RTA between two countries, therefore, underestimating or

overestimating the coefficient of the RTA on bilateral trade. Although statistically significant results are reported, however, the data did not account for some known or unknown variables that cannot be controlled for such that it accounts for changes in the bilateral trade levels over the years.

The panel nature of the data presents the cross-sectional information of the countries as well as the changes observed in this information over time. Thus, the panel nature of the dataset and applying the necessary statistical method will make it possible to control for omitted variables that differ across countries but is constant over the 20 year period. Also, variables that are constant across countries but varied over the same period will be controlled for.

Furthermore, Hausman Test was conducted to determine which model between the fixed effect and random effect better suits the panel data sample. The results of the Hausman test showed that  $\text{Prob} > \chi^2 = 0 (< .05)$ . Therefore, since the P-value is significant, the consistent model of the fixed effect was adopted for this dataset.

The table below presents the result of the panel data (fixed effect) of the dataset of bilateral trade between African countries. The results presented in table 4.2 differs from the results of the Pooled OLS. The GDP of the exporting and importing country are both statistically significant at the 1 percent significance level. Also, population of the importing country was significant in columns 1, 2, and 3, but columns 4 and 5 are statistically zero. However, the estimated coefficients and significance of other variables in the gravity equation stand in contrast to the results presented in Table 4.1, exporting country's population, and the coefficient of the RTA are all not significant, therefore, do not have any effect on determining the level of bilateral trade among African countries. The impact of common official language and distance on bilateral trade were both omitted in the fixed data analysis on trade flows among countries. In addition,

the contiguity and land areas of both the exporter and importer countries were also omitted in the fixed effect analysis due to collinearity. The interaction term between population and land area was also not statistically significant in all but one. Thus, the determinants of bilateral trade flows between countries in Africa based on the fixed effect result are income of both countries.

Table 4.2 Results of the Panel Data (Fixed Effect) Method

VARIABLES	(1) Export	(2) Export	(3) Export	(4) Export	(5) Export	(6) Export
Exporter GDP	0.46*** (0.08)	0.46*** (0.08)	0.46*** (0.08)	0.47*** (0.09)	0.47*** (0.09)	0.47*** (0.08)
Importer GDP	0.34*** (0.08)	0.34*** (0.08)	0.34*** (0.08)	0.33*** (0.08)	0.33*** (0.08)	0.33*** (0.08)
Exporter Pop.	-0.19 (0.44)	-0.19 (0.44)	-0.19 (0.44)	-0.02 (1.49)	-0.02 (1.49)	
Importer Pop.	1.83*** (0.46)	1.83*** (0.46)	1.83*** (0.46)	1.37 (1.38)	1.37 (1.38)	
Distance	-	-	-	-	-	-
RTA	-0.10 (0.15)	-0.10 (0.15)	-0.10 (0.15)	-0.10 (0.15)	-0.10 (0.15)	-0.10 (0.15)
Common Official language		-	-	-	-	-
Contiguity		-	-	-	-	-
Exporter Land Area			-	-		
Importer Land Area			-	-		
Exporter Population*Land Area				-0.01 (0.11)	-0.01 (0.11)	-0.01 (0.03)
Importer Population*Land Area				0.04 (0.11)	0.04 (0.11)	0.14*** (0.04)
Observations	23,302	23,302	23,302	23,302	23,302	23,302
R-squared	0.14	0.14	0.14	0.14	0.14	0.14
Number of panel_id	1,709	1,709	1,709	1,709	1,709	1,709

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Therefore, the null hypothesis ( $H_0$ ) of the first research question is rejected, and this means that at least one of the estimated coefficients of the independent variables is equal to zero. Based on the Panel data results, the impact of the inter-regional trade agreements is statistically not significant on trade flows, therefore, the null hypothesis of the second research question cannot be rejected. This result seem to buttress the position of Omilola (2011) when he concluded that “African RTAs have not met most of the desired conditions required for successful RTAs”. He further stated that the lack of complementarity, dependence on primary products as main exports, recurrent political instability and conflicts, weaker infrastructure and communication linkages etc. are some of the reasons for the dismal performance of RTAs in Africa. The same conclusion was also reached by Meyer et al (2010) when they identified capacity constraints as hindrance to the success of RTAs in Africa. They highlighted the lack of investment in institutional infrastructure as one of the factors limiting the economic integration.

## CHAPTER FIVE

### SUMMARY, RECOMMENDATION AND CONCLUSION

This chapter documents the summary, recommendation and conclusion of this study. It is organized into three different sections; the first section discusses the summary of findings based on the two research objectives of the study, the second section concludes the whole study. The final section presents the recommendation for further studies and policy initiatives.

#### 5.1 SUMMARY OF FINDINGS

The aim of this study was to determine the factors that influence bilateral trade among countries in Africa and the impact of regional trading agreements in facilitating trade. The study made use of gravity equation model as its theoretical orientation and the methodology utilized the longitudinal research method with data downloaded from the IMF direction of trade statistics. The dataset was analyzed using two different statistical technique; they are the pooled ordinary least square and panel data fixed effect. However, the results of the two techniques on the same dataset differs.

The results of the data analysis using pooled OLS revealed that all the variables in the gravity equation are statistically significant on the trade flow between trading partners. The income of exporting and importing countries, their population, and the effect of border as well as the common official language, all justified the previous studies that utilized the gravity equation. This indicates that the first objective was satisfied, that is, these variables are important determinants of bilateral trade in Africa. The impact of regional trading agreement was also found to be positively statistically significant. Thus, satisfying the second objective of the study.

However, the panel data fixed effect analysis presented a different result from the pooled OLS, only the income of the trading partners was found to be significant. While other variables in the equation are statistically zero on the trade volume. Also, RTA was found to have no significance on trade flows. Therefore, only the first research objective was partially satisfied whereas the second objective of the study failed.

## 5.2 CONCLUSION

The need to push for trade liberalization, economic cooperation and integration, tackle insecurity and conflict, achieve social development and foster cultural alliance has resorted to the establishment of several regional economic communities on the continent of Africa. The RECs are designed to reduce trade cost and harmonize political and economic policies, thereby further integrating the economies of the members into the global trading economy. However, these RECs have been found to be inefficient in achieving most of these objectives.

The findings of this study buttress the fact that African RTAs lack the capacity to promote international trade among its members, especially inter-regional trade. Also, the significance of the GDP of both countries in relation to the positive significance of distance between trading partners in the fixed effect model tend to suggest that high income countries trade more with each other regardless of the distance between them.

The insignificance of some of the variables tested in this study through the fixed effect on the bilateral trade volume attest to the inefficiency of RTAs. This is evident in the lack of reporting of trade activities, zero level of trade volume, lack of complementarity of their economies, security issues and conflict across borders, lack of political stability, and most importantly, the non-implementation of regional policies as a result of institutional weakness,

lack of trust and incoherent national policies. All these and others have slowed the economic integration process and delayed the achievement of the continental free trade agreement.

### 5.3 RECOMMENDATION

On the basis of the result that emerged from this study, the following recommendations are proffered to ensure that trade agreements in Africa are properly designed and adequately implemented in order to achieve their set out objectives.

1. The participation of countries in multiple RECs should be reduced in order to avoid overlapping of objectives.
2. The objectives of the RECs should be broaden to allow free movement of resources, capital, and people thereby promoting socio-economic integration.
3. Encourage the diversification of the economies of countries in each region by focusing on where their economies have comparative advantage thereby achieving the much needed complementarity in trade flows.
4. The ease of goods across the borders should be prioritized in order to create more trading channels within the continent.
5. REC member countries should encourage their members to report actual trade volume, logistics problem, and institutional challenges to relevant organizations.

## REFERENCES

- Ackah, C., Turkson, F. E., & Kwadwo, O. (2013, January). Measuring Trade Costs in Economic Community of West African States (ECOWAS). *Modern Economy*, 56-65. doi:10.4236/me.2013.41007
- Adam, A. M., & Chaudhry, I. S. (2014). The Currency Union Effect on Intra-regional Trade in Economic Community of West African States (ECOWAS). *Journal of International Trade Law and Policy*, 13(2), 102-122.
- Brown, O., Shaheen, F. H., Khan, S. R., & Yusuf, M. (2005). *Regional Trade Agreements: Promoting Conflict or Building Peace?* Manitoba: International Institute for Sustainable Development. Retrieved from [www.iisd.org](http://www.iisd.org)
- Chiumya, C. C. (2009). Regional Trade Agreements: An African Perspective of Challenges for Customs Policies and Future Strategies. *World Customs Journal*, 3(2), 85-92.
- Christie, E. (2002). Potential Trade in South-East Europe: A Gravity Model Approach. *SEER - South-East Europe Review for Labour and Social Affairs*(04), 81-101. Retrieved from [www.ceeol.com](http://www.ceeol.com)
- Cooper, W., & Manyin, M. (2011). The U.S.-South Korea Free Trade Agreement (KORUS FTA): Looking Ahead--Prospects and Potential Challenges. *International Journal of Korean Studies*, XV(2), 127-150.
- Essien, V. (2006). Regional Trade Agreements in Africa: A Historical and Bibliographical Account of ECOWAS and CEMAC. Retrieved from [http://www.nyulawglobal.org/globalex/CEMAC\\_ECOWAS.html](http://www.nyulawglobal.org/globalex/CEMAC_ECOWAS.html)
- Feenstra, R. C. (2004). *Advanced International Trade: Theory and Evidence*. Princeton: Princeton University Press.
- Felbermayr, G., Larch, M., Flach, L., Yalcin, E., & Benz, S. (2013). *Dimensions and Effects of a Transatlantic Free Trade Agreement Between the EU and US*. Munich: German Federal Ministry of Economics and Technology.
- Felipe, J., & Kumar, U. (2010). The Role of Trade Facilitation in Central Asia: A Gravity Model (Working Paper No. 628). Retrieved from The Levy Economics Institute website: <http://www.levyinstitute.org>.
- Head, K., T., M., & J., R. (2010). The Erosion of Colonial Trade Linkages After Independence. *Journal of International Economics*, 81(1), 1-14.

- Helliwell, J. F., Lee, F. C., & Messinger, H. (1999, April). Effectives of the Canada-United States Free Trade Agreement on Interprovincial Trade. *Perspectives on North American Free Trade, Paper Number 5*.
- Jin, H. J., Koo, W. W., & Sul, B. (2006, December). The Effects of the Free Trade Agreement among China, Japan and South Korea. *Journal of Economic Development, 31(2)*, 55-72.
- Kepaptsoglou, K., Karlaftis, M. G., & Tsamboulas, D. (2010). The Gravity Model Specification for Modeling International Trade Flows and Free Trade Agreement Effects: A 10-year Review of Empirical Studies. *The Open Economics Journal, 3*, 1-13.
- Khoso, I., Ram, N., Shah, A. A., Shafiq, K., & Shaikh, F. M. (2011). Analysis of Welfare Effects of South Asia Free Trade Agreement (SAFTA) on Pakistan's Economy by Using CGE Model. *7(1)*, 92-101. Retrieved from [www.ccsnet.org/ass](http://www.ccsnet.org/ass)
- Kone, S. (2010, March). Economic Partnership Agreement between West Africa and the European Union in the Context of the World Trade Organization (WTO) and the Regional Integration Process. *Journal of Economic Integration, 25(1)*, 105-129.
- Martinez-Zarzoso, I. (2003). Gravity Model: An Application to Trade Between Regional Blocs. *Atlantic Economic Journal, 31(2)*, 174-187.
- Melo, J. d., & Tsikata, Y. (2014). Regional Integration in Africa: Challenges and Prospects. *WIDER Working Paper 2014/037*. Retrieved from [www.wider.unu.edu](http://www.wider.unu.edu)
- Meyer, N., Fenyés, T., Breitenbach, M., & Idsardi, E. (2010). Bilateral and Regional Trade Agreements and Technical Barriers to Trade: An African Perspective. *OECD Trade Policy Working Papers, No. 96*. OECD Publishing. doi:10.1787/5kmdbgfrgnbv-en
- Ojo, O. J. (1980). Nigeria and the formation of ECOWAS. *International Organization, 34*, 571-604. doi:10.1017/s0020818300018853
- Omilola, B. (2011, June). To What Extent are Regional Trade Arrangements in Africa Fulfilling the Conditions for Successful RTAs? *Journal of African Studies and Development, 3(6)*, 105-113.
- Omilola, B. (2007). African Regional Trade Arrangements: Conditions, Requirements and Implications for Regional Integration. *Proceedings of the African Economic Conference*, (pp. 85-110).
- Organization of African Unity. (n.d.). Treaty Establishing The African Economic Community.
- Romalis, J. (2004, December). NAFTA's and CUSFTA's Impact on International Trade. Retrieved from <http://www.johnromalis.com/wp-content/uploads/2012/07/naftaper.pdf>

Rose, A. K. (2004). Do We Really Know That the WTO Increases Trade? *American Economic Review*, 94, 98-114.

Scollay, R. (2001). Regional Trade Agreements and Developing Countries: The Case of the Pacific Islands' Proposed Free Trade Agreement. *Policy Issues in International Trade and Commodities Study Series. No. 10*. United Nations Publication.

Whalley, J. (1998). Why Do Countries Seek Regional Trade Agreements? In J. A. Frankel, *The Regionalization of the World Economy* (pp. 63-90). University of Chicago Press.

[www.focusafrica.gov.in/Trade\\_Agreements\\_Africa.html](http://www.focusafrica.gov.in/Trade_Agreements_Africa.html)

[www.uneca.org/oria/pages/african-union-au-regional-economic-communities-recs-africa](http://www.uneca.org/oria/pages/african-union-au-regional-economic-communities-recs-africa)

[www.wto.org/english/res\\_e/booksp\\_e/analytic\\_index\\_e/gatt1994\\_09\\_e.htm](http://www.wto.org/english/res_e/booksp_e/analytic_index_e/gatt1994_09_e.htm)

UNCTAD (July, 2015). Making Regional Trade Work for Africa: Turning Words into Deeds (Policy Brief No. 34).