

**ASSESSING THE IMPACT OF REGIONAL TRADE AGREEMENTS ON EXPORT  
FLOWS: A STUDY OF SUB-SAHARAN AFRICAN (SSA) RTAs**

by

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## **DECLARATION**

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I, Yannick Kapambu Kangudia, confirm that this dissertation “ASSESSING THE IMPACT OF AFRICAN REGIONAL TRADE AGREEMENTS ON EXPORT FLOWS: A STUDY OF SUB-SAHARAN AFRICAN (SSA) RTAs” is my original work and all the sources that have been referred to have been acknowledged accordingly.

Signature (Mr. Y.K. Kangudia) .....

Date .....

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## ABSTRACT

Studies explaining international the impacts of regional trade agreements (RTAs) on trade flows in Sub-Saharan Africa (SSA) are sparse. The available research indicates that inter-regional trade in SSA is limited because the countries in the region appear to have similar patterns of trade. The available literature is based largely on data that is at least 5 years old and although the impact of overlapping membership has recently been incorporated in the literature, there is need for more attention on the impact of overlapping membership of RTAs on trade amongst these countries, especially considering the ambiguity in the findings. This study adopts the gravity model to investigate the impact of RTAs in SSA on the exports of the RTA member countries. Using trade data of 42 SSA countries, this study applies panel data-estimation techniques, to explain the impact of RTAs on exports within the major RTAs in SSA. The study finds that membership to COMESA, EAC and ECOWAS blocs enhances the RTA exports. However, although membership to SADC enhances intra-regional exports, the relative contribution is less than that of the ECOWAS, COMESA and the EAC. This might be due to the dominance of South Africa within SADC, not only in regional trade, but also in other economic aspects such as manufacturing, transport and warehousing. In terms of the impact of overlapping membership, the overlap between EAC and COMESA enhances exports of the countries in the overlap, such as Kenya, Rwanda and Uganda than the overlap between SADC and COMESA. Tanzania has dual membership of SADC and EAC and is the only country to benefit because of this dual membership. Furthermore, the findings reveal that China has a favorable and considerable impact on exports of all SSA countries in the three RTAs.

Key terms:

*Regional Trade Agreements, Sub-Saharan Africa, Gravity Equation, Trade Creation, Overlapping membership.*

## OKUCASHUNIWE

Ucwaningo oluchaza amazwe ngamazwe umthelela wezivumelwano zohwebo zesifunda (ama-RTA) ekuhwebeni kweningizimu Sahara ye-Africa (SSA) luncane. Ucwaningo olutholakalayo lubonisa ukuthi ukuhwebelana phakathi kwezifunda ku-SSA kunqunyelwe ngoba amazwe akulesi sifunda abonakala enamaphethini afanayo okuhweba. Izincwadi ezitholakalayo zisekelwe kakhulu eminingwaneni okungenani eneminyaka emi-5 ubudala futhi nakuba umthelela wobulungu wokusebenzisana usanda kufakwa ezincwadini, kunesidingo sokunakwa okwengeziwe emtheleni wokubambisana kobulungu be-RTA kwezohwebo phakathi kwalawa mazwe, ikakhulukazi uma kubhekwa ukungaqondakali kokutholakele. Lolu cwainingo lwamukela isifanekiso sokubikezela ukuze kuphenywe umthelela wama-RTA ku-SSA ekuthengisweni ngaphandle kwamazwe angamalungu e-RTA. Kusetshenziswa iminingwane yokuhweba yamazwe angama-34 e-SSA, lolu cwainingo lusebenzisa amasu wesampula yabahlanganyeli wokulinganisa iminingwane, ukuchaza umthelela wama-RTA ekuthunyelweni kwamanye amazwe ngaphakathi kwama-RTA amakhulu ku-SSA. Ucwaningo luthola ukuthi amaqembu anentshisekelo efanayo i-COMESA, EAC kanye ne-ECOWAS aneqhaza elikhulu ekuthunyelweni kwempahla kwamanye amazwe esifunda. Nokho, nakuba ubulungu be-SADC buthuthukisa ukuthunyelwa kwempahla kwamanye amazwe ngaphakathi kwesifunda, umnikelo ohlobene ungaphansi kwalowo we-ECOWAS, COMESA kanye ne-EAC. Lokhu kungase kube ngenxa yokubusa kweNingizimu Afrika ngaphakathi kwe-SADC, hhayi kuphela ekuhwebeni kwesifunda, kodwa nakwezinye izici zomnotho ezifana nokukhiqiza, ezokuthutha kanye nokugcinwa kwempahla. Ukusebenzisana phakathi kwe-EAC ne-COMESA kunomthelela omkhulu ekuthengisweni kwamanye amazwe emazweni asebenzisanayo, afana ne-Kenya, i-Rwanda ne-Uganda kunokusebenzisana phakathi kwe-SADC ne-COMESA. ITanzania kuphela enobulungu obukabili be-SADC ne-EAC futhi izwe liyazuzisa ngenxa yalobu bulungu obukabili. Ngaphezu kwalokho, okutholakele kuveza ukuthi i-China inomthelela omuhle futhi omkhulu ekuthengisweni kwamanye amazwe kwawo wonke amazwe e-SSA kuma-RTA amane.

# TSHOBOKANYO

Dithutopatlisiso tse di tlhalosang ditlamorago tsa boditshabatshaba tsa ditumelano tsa kgwebisano ya mo kgaolong (di-RTA) mo kelelong ya dithomeloteng le dithomelontle mo Dikgaolong tsa Aforika tse di mo Borwa jwa Sahara (SSA) di mmalwanyana fela. Tlhotlhomiso e e setseng e le teng e kaya gore kgwebisano ya mo kgaolong mo SSA e nnyane gonne dinaga tse di mo kgaolong di bonala di na le mekgwatiriso e e tshwanang ya kgwebisano. Dikwalo tse di leng teng di theilwe segolo thata mo deitheng ya sebaka sa bonnye dingwaga di le 5 mme le fa ditlamorago tsa gore naga e e rileng ke leloko la ditumelano di le mmalwa tsa kgwebisano ya mo kgaolong di sa tswa go akarediwa mo dikwalweng, go na le tlhokego ya go tsepamisa thata mo ditlamoragong tsa gore naga e e rileng e nne leloko la di-RTA di le mmalwa mo kgwebisanong ya fa gare ga dinaga tseno, segolo bogolo re akanyetsa bokaopedi jo bo tlhagelelang mo diphithlelong. Thutopatlisiso eno e dirisa sekao sa ponelopele ya seemo sa ikonomi ya dinaga tse di gwebisanang go ya ka selekano sa kgwebisano ya tsone go batlisisa ditlamorago tsa di-RTA mo SSA mo dithomelong-ntle tsa dinaga tse e leng maloko a RTA. Ka go dirisa deitha ya kgwebisano ya dinaga di le 34 tsa SSA, thutopatlisiso eno e dirisa mekgwatiriso ya go fopholetsa deitha e e kgobokantsweng ka go baya leitlho mo sampoleng e le nosi mo nakong e e rileng, go tlhalosa ditlamorago tsa di-RTA mo dithomelong-ntle tse di diregang mo di-RTA tse dikgolo mo SSA. Thutopatlisiso e fitlhelela gore dinaga tse di dirisanang mmogo tsa COMESA, EAC le ECOWAS di na le seabe se segolo mo dithomelong-ntle tsa kgaolo. Le fa go ntse jalo, le fa go nna leloko la SADC go oketsa dithomelontle tsa mo gare ga kgaolo, seabe sa papiso se ka fa tlase ga sa ECOWAS, COMESA le EAC. Seno e ka tswa e le ka ntlha ya maatla le tlhotlheetso ya Aforikaborwa mo SADC, e seng fela mo kgwebisanong ya mo kgaolong, mme gape mo dikarolwaneng tse dingwe tsa ikonomi tse di jaaka tlhagisokuno mo madirelong, dipalangwa le polokelo ya dikuno. Go nna leloko la di-RTA di le mmalwa fa gare ga EAC le COMESA go na le seabe se segolo mo dithomelong-ntle tsa dinaga tse e leng maloko a di-RTA di le mmalwa, tse di jaaka Kenya, Rwanda le Uganda go feta sa dinaga tse e leng maloko a di-RTA di le mmalwa fa gare ga SADC le COMESA. Ke Tanzania fela e e nang le botokololo-pedi jwa SADC le EAC mme naga e ikungwela mosola ka ntlha ya botokololo-pedi jono. Gape, diphithlelelo di senola gore China e na le ditlamorago tse di siameng le tse dikgolo mo dithomelong-ntle tsa dinaga tsoatlhe tsa SSA mo di-RTA di le nne.

Mafoko a botlhokwa: *Ditumelano tsa Kgwebisano ya mo Kgaolong, Dikgaolo tsa Aforika tse di mo Borwa jwa Sahara, ponelopele ya seemo sa ikonomi ya dinaga tse di gwebisanang go ya ka selekano sa kgwebisano ya tsona, Tshimololo ya Kgwebisano, Seemo sa gore naga e e rileng ke leloko la di-RTA di le mmalwa.*

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## ACRONYMS

AEC	African Economic Community
AfCFTA	African Continental Free Trade Area
AMU	Arab Maghreb Union
ANDEAN	Group of Western South America along the Andes Mountain range.
ASEAN	Association of Southeast Asian Nations
ATPC	African Trade Policy Centre
AU	African Union
BBC	British Broadcasting Corporation
BoP	Balance of Payments
CACM	Central American Common Market
CACU	Central African Customs Union
CAR	Central African Republic
CEPII	Centre d'Études Prospectives et d'Informations Internationales (Institute for Research on the International Economy)
CEMAC	Central African Economic and Monetary Community
CEN-SAD	Community of Sahel-Saharan States
CES	Constant Elasticity of Substitution
CFR	Council on Foreign Relations
CGE	Computable General Equilibrium Modelling
COPAX	Council for Peace and Security in Central Africa
COMESA	Common Market for Eastern and Southern Africa
CU	Customs Union
DIRCO	Department of International Relations and Cooperation
DRC	The Democratic Republic of Congo
EAC	East African Community
EC	European Commission
ECA	Economic Commission for Africa
ECCAS	Economic Community of Central African States
ECOWAS	Economic Community of West African States
EU	European Union
EFTA	European Free Trade Association
EPA	Economic Partnership Agreement
EUROSTAT	European Union Statistics
FDI	Foreign Direct Investment
FTA	Free Trade Agreement
IAT	Intra-African Trade
ICT	Information and Communications Technology
IGAD	Intergovernmental Authority on Development

IMF	International Monetary Fund
LAIA	Landscape Architecture Investigation & Applications
LDC	Least Developed Country
MDG	Millennium Development Goals
MERCOSUR	Meracado Común del Sur (The Southern Common Market)
MFN	Most Favoured Nations
NAFTA	North America Free Trade Agreement
NTB	Non-Tariff Barriers
OAU	Organisation of African Unity
OCA	Optimum Currency Area
ODA	Official Development Assistance
OECD	Organisation for Economic Co-operation and Development
OLS	Ordinary Least-squares model
PAFTA	Peru-Australia Free Trade Agreement
PTA	Preferential Trading Agreements
ROW	Rest of the World
RTA	Regional Trade Agreement
SACU	Southern African Customs Union
SADC	Southern African Development Community
SAPTA	Support for Addictions Prevention and Treatment in Africa
SPARTECA	South Pacific Regional Trade and Economic Cooperation Agreement
SSA	Sub-Saharan Africa
TWG	Technical Working Groups
TDCA	Trade, Development and Cooperation Agreement
UEMOA	Union Economique et Monétaire Quest Africaine (West African Economic and Monetary Union)
UMA	Union de Maghreb Arabe (Arab Maghreb Union)
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNECA	United Nations Economic Commission for Africa
WAEMU	West African Economic and Monetary Union
WDI	World Development Indicators
WITS	World Integrated Trade Solutions
WTO	World Trade Organisation

# CHAPTER 1: INTRODUCTION

## 1.1 Introduction

The desire to overcome economic underdevelopment has forced African countries with common objectives to form regional organizations that are regulated by treaties (UNCTAD, 2019). Conventionally, Regional Trade Agreements (RTAs) are intended to help expand regional trade, achieve economies of scale and diversify economic sectors. According to the United Nations Development Program (UNDP, 2018) there are six known RTAs in Sub-Saharan Africa (SSA), namely the East African Community (EAC), the Southern Africa Development Community (SADC), the Economic Community of West African States (ECOWAS); Common Market for Eastern and Southern Africa (COMESA), the Economic and Monetary Community of Central Africa (CEMAC) and the West African Economic and Monetary Union (UEMOA). Of these, only the first three, EAC, SADC and ECOWAS have implemented treaties on peace, trade as well as the movement of people across the borders of their member states.<sup>1</sup>

The role of RTAs in promoting intra-continental trade has gained prominence in academic and policy circles during the last decade. For example, de Melo & Tsikata (2014) find that the share of intra-RTAs imports increased after the RTAs were established. In addition, the cost of conducting intra-regional trade declined in all the RTAs in SSA except the EAC (de Melo & Tsikata, 2014). According to the United Nations Conference on Trade and Development (UNCTAD) (2019), although Africa is home to 16.3 percent of the world population, it only accounts for 2.9 percent of global output and 2.6 percent of global trade. Furthermore, intra-regional imports account for less than 10 percent of total imports of the main RTAs in SSA. Nevertheless, trade performance seems to be improving in SSA countries. For example, in 2017, the value of merchandise exported and imported by SSA countries increased by 17.4 percent and 6.9 percent respectively. There was

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<sup>1</sup>Data limitations or challenges prevent meaningful trade analysis of Central Africa Republic, Cameroun and Chad which fall in the CEMAC.

also a decrease in trade deficit from 42.6 billion US\$ in 2016 to 19.4 billion US\$ in 2017 (IMF, 2018).

## **1.2 Problem Statement**

The socio-economic situation in SSA is fragile and the region remains vulnerable to domestic and external shocks. The sub-continent is characterized by low growth, underdevelopment and funding gaps and many parts of the region remains highly impoverished (Juma & Mangeni, 2015). As such, strategies for reducing these socio-economic challenges are prominent in many of these countries' development agendas. International trade is one of the ways by which SSA countries can enhance economic growth and development. The region's strong reliance on trade and trade earnings demonstrates the importance of trade to the region. Between 2000 and 2017, Africa's share of global exports ranged between 80 percent and 90 percent (Juma & Mangeni, 2015).

To address the economic growth and development challenges, many SSA countries have entered multiple RTA arrangements, sometimes with overlapping memberships (United Nations Economic Commission for Africa (UNECA), 2004). However, despite these regional trade agreements, the magnitude of the region's trade within itself compared to its trade with the rest of the world (ROW) remains small. For example, Intra-SSA exports were 16.6 percent of SSA total exports in 2017 while the region's exports to Europe, Asia and the America's was 68.1 percent, 59.4percent and 55 percent (Juma & Mangeni, 2015; UNCTAD 2019).

There remains a paucity of studies that have examined the impact of RTAs on trade flows of SSA, and the results are mixed. For instance, Hallaert (2007) observe that RTAs have no effect on member nations' trade flows while Foroutan & Pritchett (1993), Rodrick (1998), and Carrère (2004) assert that SSA RTAs have improved export performance among members states. A more recent study by Gammadigbe (2021) finds that RTAs in SSA enhance economic activities including regional trade in the region. In addition, only a handful of studies have considered the impact of overlapping RTAs membership on trade flows and the results have been ambiguous. For instance, Ngepha and Udeagha (2019) find that multi-memberships have significant additional intra-Africa trade benefits which increase with the number of memberships while and Fanta (2021) observe that overlapping memberships in east and Southern Africa significantly and negatively affects intra-regional trade share. The ambiguity in the findings highlights the need for more research into the

nexus. These mixed findings may be due to the differences in the methods of investigation and the omission of key variables in the models used. Moser & Rose (2011), for instance, use Ordinary Least Squares (OLS), which has been noted to create inconsistencies in calculations (Silverstovs & Schumacher, 2009), whereas other studies such as Hallaert (2007) use Computable General Equilibrium (CGE) models, which take an ex-ante approach to calculate the future aspects of new trade policies rather than the effects of previous policies.

Furthermore, countries belong to more than one RTAs and only a few of the previous research has documented the impact of overlapping membership of RTAs on trade flows in the region. For example, Ngepah and Udeagha (2018) investigate the role of RTAs in Africa on trade activities on the continent with data spanning 1995 to 2014 and find that the impact is dependent on the implementation of the policies. In this regard, the authors aver that RTAs are trade enhancing in SADC, ECOWAS, Economic and Monetary Community of Central Africa (EMCCA) but not in EAC. One omission of the study by Ngepah and Udeagha (2018) is that, although it investigates a large number of RTAs some of which are overlapping, e.g., COMESA and SACU, it fails to empirically test the role of overlapping RTAs membership on the impact of RTAs on trade flows in the SSA countries. The most recent study on RTAs in Africa is that of Fanta (2021) which investigates specifically the impact of overlapping RTAs memberships of four RTAs in Southern Africa and Eastern Africa, namely Intergovernmental Authority for Development (IGAD), COMESA, SADC and EAC. The author finds that overlapping membership negatively impacts intra-regional trade in the four RTAs. However, this study only covers up to 2012. The ambiguity in the findings on the impact of overlapping memberships of RTAs in Africa indicates the need for further research.

Given the above, this study uses data of member countries in the COMESA, SADC, ECOWAS, EAC and SACU by adopting an augmented gravity model to analyze the impact of these three RTAs on their respective intra-regional export flows. It is noted that de Melo & Tsikata (2014), Ngepah and Udeagha (2019) and Fanta (2021) have examined this nexus; however, this study differs from the above-mentioned studies in a number of ways. This study differs from de Melo & Tsikata's (2014) study in four significant ways: (i) while de Melo & Tsikata (2014) consider all the RTAs in Africa, this study narrows the focus to prominent SSA RTAs only, namely COMESA, SADC, SACU, EAC and ECOWAS; (ii) de Melo & Tsikata (2014) employ imports as



the dependent variable while this study uses export<sup>2</sup>; (iii) this study considers China's growing role in SSA's export flows and its impact on the RTAs; and (iv) lastly this study explores how overlapping RTAs memberships affect export flows in the RTAs. Lastly, Ngepah and Udeagha (2019) and Fanta (2021) are the most recent studies to consider the impact of RTAs on export performance in African RTAs, however their studies used data spanning 1995-2014 and 1992-2012 respectively, this study considers more current data by examining the nexus for the period 2008 to 2018.

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

The main objective of this study is to examine the effect of RTAs on RTA export flows in selected SSA RTAs from 2008 to 2018. The specific research objectives are to:

- Provide an understanding of the RTAs in SSA.
- Examine the impact of RTAs on export flows in SSA using an augmented gravity model.
- Examine the role of trade with China on intra-SSA export flows
- Examine the impact of overlapping RTAs membership on RTAs export flows.
- Provide policy recommendations based on the study findings.

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

Enhancing SSA's economic growth and development is critical for overcoming the region's numerous socio-economic challenges. International trade is widely accepted as having a favorable impact on economic growth. The low levels of trade between SSA countries compared to the region's trade with non-SSA countries suggests that there is need to bolster intra-regional trade. RTAs may be a viable option for achieving enhanced trade and thus enhancing growth. This study is important in illuminating the impact of RTAs in promoting trade and hence growth in the selected SSA nations. As such, this study provides an understanding of the SADC, COMESA, EAC and ECOWAS RTAs with respect to the dynamics of trade between and within the RTA's and how membership to these RTAs impact on their export flows. This provides insight to policy makers on trade policy with regards to RTAs. As indicated previously, there are a handful of studies that

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<sup>2</sup>Explanation for the choice of exports is provided in the methodology.

have examined the nexus, one of the most recent being Fanta (2021) whose examination of the nexus ended in 2014. however, this study advances these previous studies with the consideration of the nexus up to 2018. Therefore, this study contributes to literature on regional trade agreements. Lastly, the study will be beneficial for researchers and academics who want to explore issues on the vibrancy of RTAs in enhancing trade and supporting economic development in SSA.

### **1.5 Outline of the Study**

The study is introduced in the first chapter, the notions of regionalism as well as the history of RTAs in Africa and SSA are examined in second chapter. A survey of the theoretical framework and empirical literature on RTAs is presented in chapter three. The methodology adopted in the study is outlined in chapter four and the results of the empirical analysis are presented and discussed in chapter five. The study's conclusion and policy recommendations based on the findings are provided in chapter six.

## **CHAPTER 2: BACKGROUND OF AFRICAN AND SSA REGIONAL TRADE AGREEMENTS**

### **2.1 Introduction**

This chapter discusses the notion of regionalism. This is followed by a discussion of the shared opportunities and obstacles faced by the various RTAs in SSA. Lastly, intra-RTA trade statistics are discussed in detail.

### **2.2 The Concept of Regionalism**

Hettne (2005) defines regionalism as “an institutional process initiated by independent states to foster cooperation and coordination of their policies in certain areas”. According to Baldwin & Taglioni (2006), regionalism is “a set of at least two countries in a given geographical area coming together through treaties to promote a coherent regional grouping to benefit from the actions of public and private actors”.

Regionalism is noted by UNCTAD (2013) to bolster bilateral trade between countries in different regions. Regionalism has several effects. For instance, because the treaties formed forces countries to adjust their regulations on trade and movement of people, these adjustments have costs and rewards that affect a country's competitiveness. The lowering or removal of barriers to cross-border economic operations is frequently used to construct an economic bloc. Trade liberalization is thought to increase corporate performance, equalize GDP growth rates among member nations, and result in convergence of economic and social development levels of members (Amjadi and Yeats, 1999).

Regional integration is grounded on the concept of regionalism and is often supported by institutions and regional trade agreements (RTAs). Regional integration has numerous purposes such as economic, social and political cooperation which are all aimed at enhancing prosperity of the member states (Guillochon & Kawecki, 2009). RTAs refers to decision of governments in one region to cooperate to achieve higher levels of economic activities by, among others, removing

obstacles to trade or creating free trade areas (Taifeng, 2009). Joining an RTAs may lead to the disruption of the economy of member states, and sometimes third-party countries, through trade creation or disruption (Pant & Paul, 2018). Depending on their relative magnitudes, the distributional consequences of the two opposed results of RTAs formations (trade diversion and trade creation) can either raise or diminish global wellbeing (Lee, Mulabdic, & Ruta, 2019); Panagariya, 2000). Regional integration, according to Winters (1997), influences both the relative pre- and post-tariff pricing among member and non-member countries. As a result, it is argued that RTAs have various impact on the wellbeing of member and non-member country households. Furthermore, RTAs are thought to stimulate growth and development in member nations by establishing economic, financial, cultural, and technological networks (Cered, Cernea and Msa, Orstom 1987).

### **2.3 The Evolution of RTAs in Africa**

African countries were encouraged to merge their economies into sub-regional markets in the early 1960s, with the goal of creating a single Africa-wide economic union (DIRCO, 2004). Since then, the African Union (AU) has approved a number of resolutions and declarations, including those and discussed in Algiers at the summit in September 1968 and in Addis Ababa in August 1970, when the necessity for economic integration on the continent was raised (DIRCO, 2004). When the Abuja Treaty was issued in 1994, the AU's constitutive act was altered to focus on attaining African Economic Anion, or the Economic Community of Africa (ECA) as it was known at the time (Lecoutre, 2007). The AU was established during the Durban Summit in July 2002 (AU, 2021; de Melo & Tsikata, 2014).

The Community of Sahel-Saharan States (CEN-SAD), the East African Community (EAC), the Arab Maghreb Union (AMU), the Common Market for Eastern and Southern Africa (COMESA), the Intergovernmental Authority on Development (IGAD), the Southern Africa Development Community (SADC), the Economic Community of West African States (ECOWAS) and the Economic Community of Central African States (ECCAS) are the eight regional economic communities recognized by the African Union (Meyer et al., 2010). The SSA's 53 member nations each belong to a regional agreement which engages in important activities such as peace treaties, economic cooperation, and cross-border movement of people. The Economic Community of West

African States (ECOWAS), the Southern African Development Community (SADC) and the East African Community (EAC), they are the most active RTAs in the region (Meyer et al., 2010).

## **2.4 Overview of the Regional Economic Communities in Africa**

### **2.4.1 The Common Market for Eastern and Southern Africa (COMESA)**

The Common Market for Eastern and Southern Africa comprises 21 African States with a total of approximately 600 million People. The countries are from North Africa, Eastern Africa, Central Africa and Southern Africa, thus overlapping with other RTAs such as EAC, SADC, Amu and CEN-SAD. COMESA came into force in December 1994, when it replaced its predecessor, the Preferential Trade Area for Eastern and Southern African States COMESA (2018). The 21 member states of COMESA are Ethiopia, Eritrea, Burundi, Kenya, Malawi, Rwanda, Uganda, Zambia, Zimbabwe, Tanzania, Eswatini, Djibouti, D.R. Congo, Egypt, Tunisia, Libya, Somalia, Mauritius, Seychelles and Madagascar and Comoros. COMESA aims to form a large economic and trading unit that can overcome some of the barriers that are faced by individual states (COMESA, 2018). COMESA's aims to bring economic prosperity through regional integration and bolster trade in goods both between member states and outsiders. Geographically, COMESA is almost two thirds of the African Continent with an area of 12 million (sq km). Nine of the member states formed a free trade area in 2000 (Djibouti, Egypt, Kenya, Madagascar, Malawi, Mauritius, Sudan, Zambia and Zimbabwe), with Rwanda and Burundi joining the FTA in 2004, the Comoros and Libya in 2006, Seychelles in 2009 and Tunisia and Somalia in 2018 (COMESA, 2018).

### **2.4.2 East African Community (EAC)**

A customs union comprising only Kenya and Uganda evolved into the East African High Commission between 1948 and 1961 (EAC, 2011). In 1961, the name of the organization was changed to the East African Common Services Organization and operated as such until 1967 when the organization was transformed into the East African Community (EAC, 2011). The EAC continued for another ten years, before finally becoming defunct in 1977. For a long time, the EAC was a federal government. It operated a wide range of common services encompassing thirty institutions that included four major corporations: East African Ports, East African Railways, East African Posts and Telecommunications Corporation, and East African Airways as well as a retinue

of research institutions (EAC 2011). On the 30<sup>th</sup> of November 1993, the “Agreement for the Establishment of the Permanent Tripartite Commission for East African Cooperation” was signed, bringing the East African Co-operation into existence. The new East African Community was signed into a treaty in Arusha on the 7<sup>th</sup> of July 2000. The East African Community (EAC) has its headquarters in Arusha, Tanzania and the organization brings together the countries of Kenya, Rwanda, Burundi, Tanzania and Uganda. The EAC's mission is to strengthen economic links and trade partnerships among its member countries. In 2005, the EAC established a Customs Union, and in 2010, it established a Common Market, following ratification by all the five EAC partner states (EAC, 2011).

### **2.4.3 Economic Community of West African States (ECOWAS)**

ECOWAS is a fifteen-country regional organization founded in May 1975 (Bonjean & Brunelin, 2013). It was conceived as a mechanism for bringing economic cooperation and progress, with the objective of creating a West African economic union (ECOWAS, 2006). Senegal, Togo, Niger, Ghana, Mali, Guinea Bissau, Benin, Cape Verde, Burkina Faso, Cote d'Ivoire, the Gambia, Guinea, Liberia and Nigeria, are the member states of ECOWAS (AU, 2011; Bonjean & Brunelin, 2013).

The economic community's main goal is to speak with one voice in negotiations with countries outside the region. For example, the bloc engages in economic partnership agreements (EPAs) on behalf of the member countries with the EU. The organization also oversees implementation of infrastructure development, security actions, and the functioning of the ECOWAS common market. Other areas of cooperation include the implementation of agricultural and environmental programs, as well as the expediting of the development of a regional fund. By establishing a long-term regional development agenda, the member states have also committed to stabilizing the macroeconomic framework and business environment and ensuring security and peace in the region (Bonjean & Brunelin, 2013).

### **2.4.4 Economic Community of Central African States (ECCAS)**

The Economic Community of Central African States (ECCAS) was created in 1983 when the Central African Customs Union (CACU) and the Economic Union of Central Africa (UDEAC) persuaded member nations to build a regional umbrella body. Chad, Republic of Congo, Burundi,

Angola, Cameroon, the Democratic Republic of Congo, the Central African Republic, Equatorial Guinea, Sao Tomé and Príncipe and Gabon are ten Central African States that make up the organization (Avom & Njikam, 2015).

Conflicts in the region and the non-payment of contributions by some states slowed the progress of the union (Foroutan, 1993). In 1999, the organization broadened its focus beyond economic challenges to incorporate peace and security measures into its overall operations. The Council of Peace and Security in Central Africa (COPAX) was established by ECCAS member nations to promote and preserve peace and security in the region. In January 2004, the COPAX protocol went into effect (Guillochon & Kawecki, 2009).

However, the existence of ECCAS is jeopardized by withdrawals and shared loyalties (Limao & Venables, 2001). Rwanda, for example, a founding member of ECCAS, left in June 2007 to join the EAC while the DRC is also an affiliate of SADC (Brenton & Isisk, 2012).

#### **2.4.5 Arab Maghreb Union (AMU)**

Amu was created on the 17<sup>th</sup> of February 1989, according to Messaoudi (1994), bringing together Tunisia, Libya, Algeria, Morocco, and Mauritania. However, shortly after its inception, the issue of Western Sahara's status brought to a head tension between Morocco and Algeria, halting the union's progress (Messaoudi, 1994).

Through extensive collaboration and the integration of efficient production systems, the nations that make up the AMU have all committed to promoting economic growth and development. They also pledged to promote good governance as well as bringing about peace and security in the region (Messaoudi, 1994). In addition, member states have committed to unify and coordinate policies and strategies in the region.

#### **2.4.6 Southern Africa Development Community (SADC)**

Like many other RTAs in SSA, the SADC was formed mainly to bring about economic development and to foster peace and security and improve the living conditions of the people in the region (Magakwe, 2013). The members states of SADC are Angola, Comoros, South Africa,

Zambia, Mozambique, Mauritius, Tanzania, Botswana, the Democratic Republic of Congo (DRC), Eswatini, Madagascar, Lesotho, Malawi, Namibia, Seychelles and Zimbabwe (Chauvin & Gaulier, 2002).

The SADC Free Trade Area (FTA) did, however, suffer major challenges, particularly in terms of implementation. For example, Angola and the DRC have not completed their membership requirements. Normalization of tariffs takes time, and there are also concerns about the business community's and public's entire commitment (Saurombe, 2009). The SADC council formed Technical Working Groups (TWGs) to solve these concerns, including common external tariffs, income collection and distribution methods, and harmonization of agricultural, infrastructure, competition, and other sectoral policies (Saurombe, 2009).

## **2.5 Features of African RTAs**

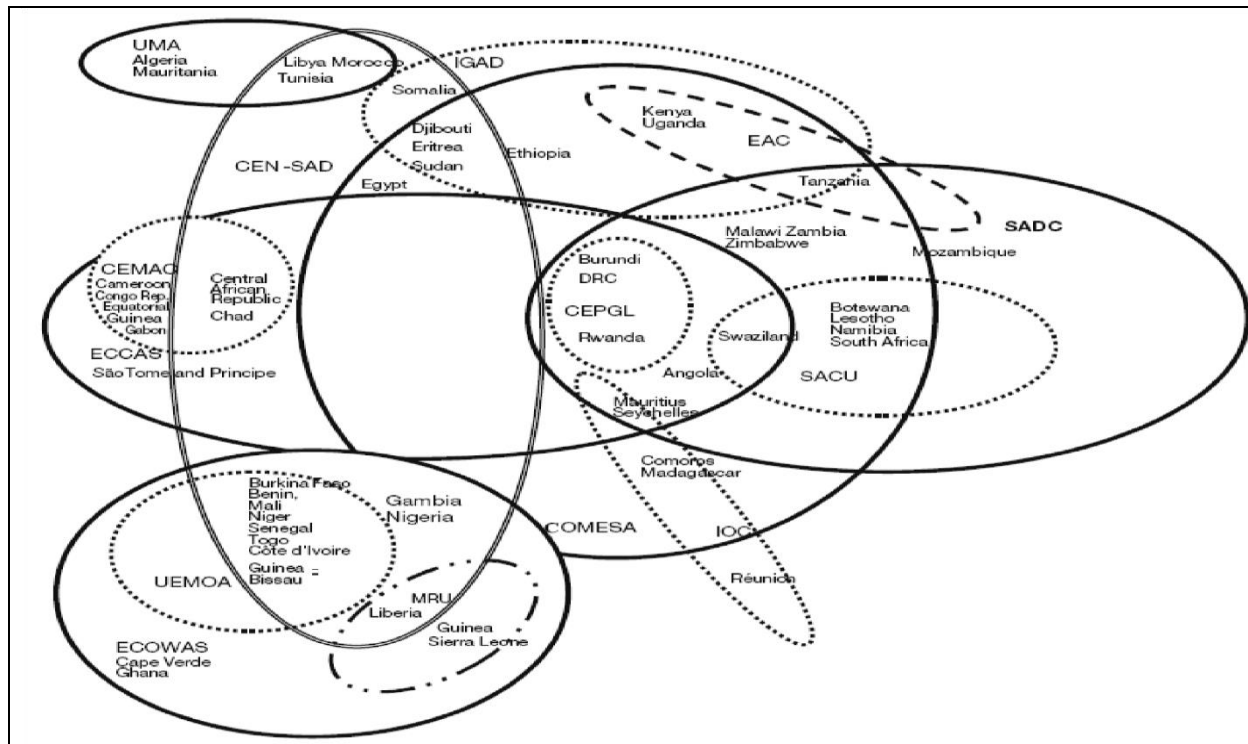
RTAs in SSA are responsible for institutionalizing trade policies, promoting cooperation and facilitating regional integration through regionalism. The coordination of the many RTAs in Africa, on the other hand, has proven to be more difficult than in any other continent (Juma and Mlangeni, 2019). The following section examines RTAs' similar opportunities and challenges in SSA.

### **2.5.1 Overlapping Memberships**

The overlapping of memberships is a prevalent feature of RTAs in Africa, where one country is a member of many RTAs. Although SSA countries have embraced regionalism, the RTAs' operations are complicated by their membership in other regional entities.



**Figure 2.1: Overlapping membership of African RTAs**



Source: Meyer et al. (2010)

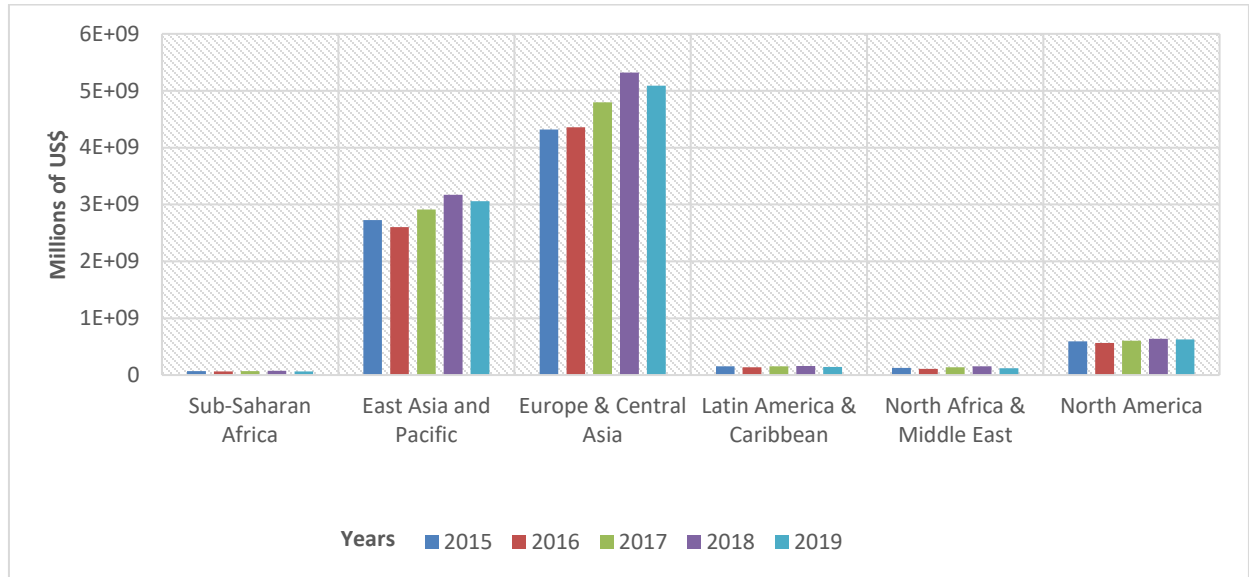
Most SSA nations have overlapping memberships, as shown in Figure 2.1. In Southern Africa, only Mozambique does not belong to another grouping within SADC while Tanzania is a member of both SADC and EAC while Rwanda has recently left ECCAS to join the EAC. Both Malawi and Zimbabwe are members of SADC and COMESA.

Each RTA has its own set of programs and objectives, and commitment to a second grouping frequently leads to a lack of coordination and tariff rate harmonization among member states (MapuvaI, and Muyengwa-Mapuva, 2014). Overlapping memberships have been linked to non-compliance with implementation plans, a lack of technical and analytical expertise, and conflicting and unstable macroeconomic policies (ECA, 2004).

### 2.5.2 Overview of Trade Flows in Sub-Saharan Africa (SSA)

This section provides a picture of total and disaggregated trade in SSA, in the different RTAs on the sub-continent and in other global regions. Looking at SSA exports between 2015 and 2019, in figure 2.2 it is observed that intra-SSA exports were the lowest of all the regions.

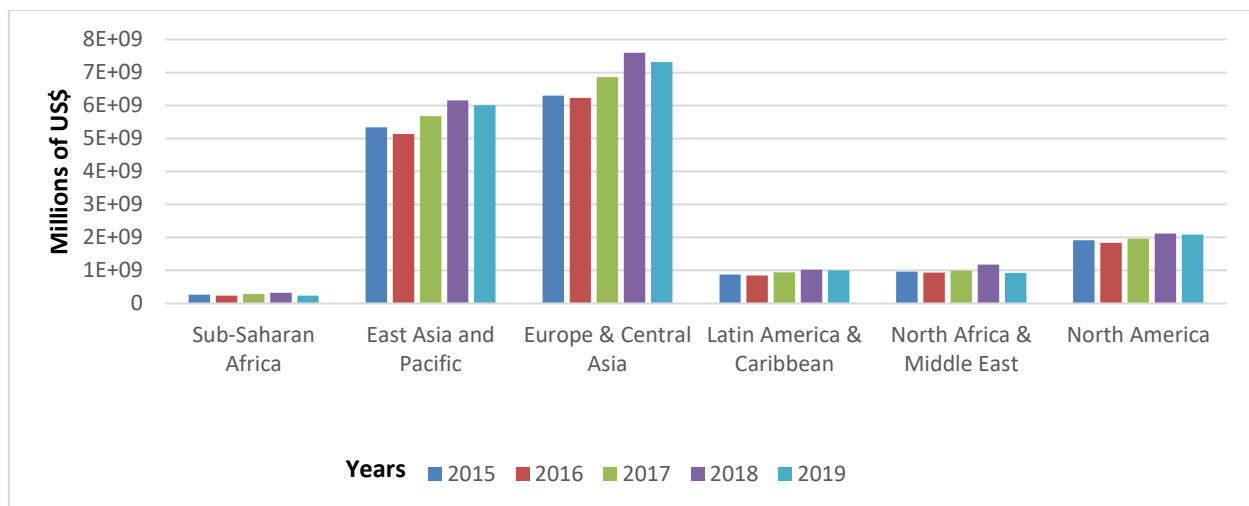
**Figure 2.2: Intra-regional Exports (US\$)**



Source: WITS (2021)

The poor performance of SSA exports is shown in Figure 2.3 below. Between 2015 and 2019, SSA exports were the lowest globally when compared to other regions. For instance, according to the WITS (2021) data, SSA exports made up 16.6 percent of total global exports in 2017, compared to 68.1 percent for Europe and Central Asia, 59.4 percent for East Asia and the Pacific, and 55.0 percent for the Americas.

**Figure 2.3: Comparative regional exports (2015 – 2019)**



Source: WITS (2021)

### 2.5.3 Overview of SSA RTAs Trade Statistics

#### (i) SADC Trade Statistics (2019)

Table 2.1 shows that between 2017 and 2020, intra-SADC exports accounted for \$29.8 billion (23 percent) of its total trade. Over this period, SADC's most active exporters were South Africa (52.1 percent) and Angola (17.4 percent). Other countries exports were marginal but notable. For example, DRC exports over the review period was 7.4 percent, Zambia (4.5 percent), Botswana (3.1 percent), Namibia (3.2 percent and Tanzania (2.6 percent). Other countries such as Eswatini, Madagascar, Malawi, Mauritius had exports that were less than two percent (WDI 2023).

**Table 2.1: The share of SADC trade by member countries (2017-2020)**

	Exports Share	Imports Share
<b>Angola</b>	17.4%	7.4%
<b>Botswana</b>	3.1%	3.4%
<b>DRC</b>	7.4%	4.1%
<b>Eswatini</b>	1.1%	0.1%
<b>Lesotho</b>	0.6%	1.1%
<b>Malawi</b>	0.5%	1.5%
<b>Mozambique</b>	2.6%	3.7%
<b>Namibia</b>	3.2%	4.2%
<b>Mauritius</b>	1.1%	2.9%
<b>Madagascar</b>	1.5%	2.1%
<b>South Africa</b>	52.1%	56.6%
<b>Tanzania</b>	2.6%	4.9%
<b>Zambia</b>	4.5%	4.2%
<b>Zimbabwe</b>	2.1%	3.0%

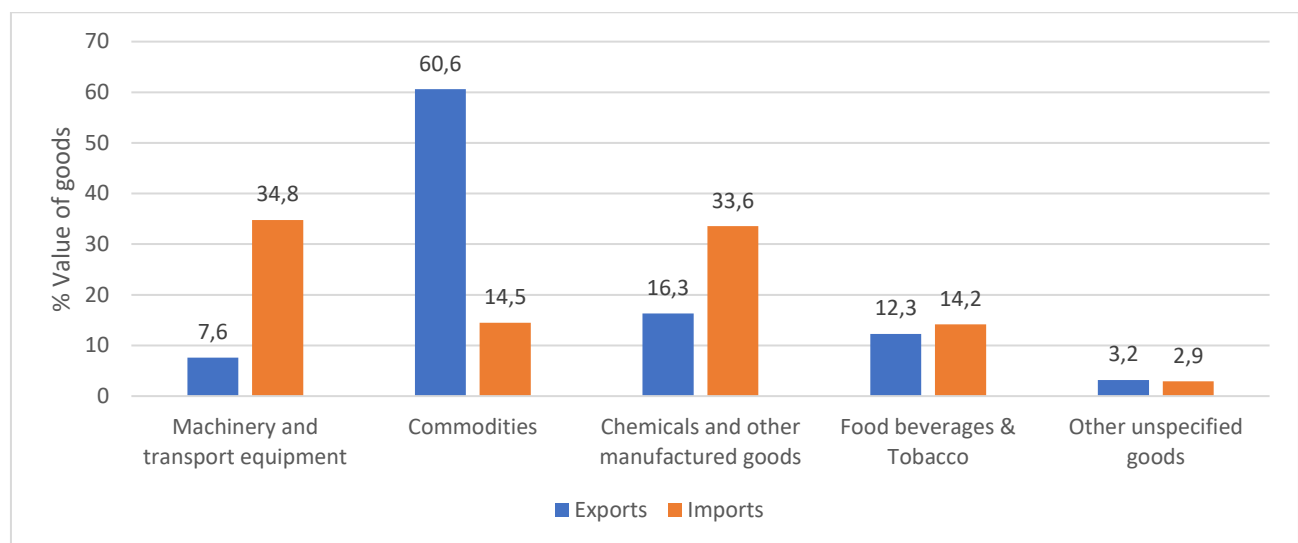
Source: WDI (2023)

South Africa was also the region's largest importer between 2017 and 2020 accounting for 56 percent of total SADC imports. Angola, Tanzania, DRC, Zambia, Namibia, and Zimbabwe accounted 7.4 percent, 4.9 percent, 4.2 percent, 4.2 percent and 3.0, percent in that order, of the

region's total imports. The two Kingdom states of Eswatini and Lesotho accounted for less than 2 percent of total regional imports.

As shown in Figure 2.4, commodities, machinery & transport equipment as well as chemicals are some of the main traded goods in the region. Food and beverages are also major traded products. Light oils, electrical energy, chromium ores, and iron ores were among the goods exported by South Africa to other SADC countries, indicating that the demand in the other SADC countries is supporting South Africa's manufacturing sector (Gitau, 2020).

**Figure 2.4: Composition of SADC exports and imports (2019)**



Source: WITS (2021)

**(ii) ECOWAS Trade Statistics (2020)**

Between 2017 and 2020, Nigeria and the Ghana were the region's largest exporters, with 55.7 percent and 16.3 percent of the region's total exports respectively. Cote d'Ivoire and Senegal ranked third and fourth, respectively, with 11.9 percent and 3.4 percent of the total regional exports. Burkina Faso is fifth ranked with a share of 3.3 percent of regional exports, while the rest of the countries in the region, Togo, Benin, Mali, Guinea, Guinea Bissau, Cape Verde and Niger each account for less than 2 percent of the region's exports as shown in Table 2.2.

Natural resources (iron ore, crude oil, bauxite, gold and manganese) and agricultural products dominate ECOWAS exports and agricultural products such as cocoa, coffee, cotton, cereals, rubber, roots & tubers, livestock, fruits and vegetable are also exported.

**Table 2.2: The share of ECOWAS trade by member countries (2017-2020)**

	<b>Export Share</b>	<b>Import Share</b>
<b>Benin</b>	0.8%	3.9%
<b>Burkina Faso</b>	3.3%	4.3%
<b>Cabo Verde</b>	0.1%	0.8%
<b>Cote d'Ivoire</b>	11.9%	10.7%
<b>Gambia</b>	0.0%	0.6%
<b>Ghana</b>	16.2%	13.3%
<b>Guinea</b>	2.8%	3.6%
<b>Guinea-Bissau</b>	0.2%	0.3%
<b>Liberia</b>	0.6%	1.1%
<b>Mali</b>	1.8%	4.9%
<b>Niger</b>	1.4%	2.3%
<b>Nigeria</b>	55.7%	42.4%
<b>Senegal</b>	3.4%	7.9%
<b>Sierra Leone</b>	0.74%	7.6%
<b>Togo</b>	0.79%	2.1%

Source: WDI (2023)

Between 2017 and 2020, Nigeria had the biggest share of imports in the region accounting for 42.4 percent of the regional imports while Ghana, Cote d’Ivoire, Senegal and Sierra Leone accounted for 13.3 percent, 10.7 percent, 7.9 percent and 7.6 percent in that order. Mali, Burkina Faso, Benin and Guinea respectively accounted for 4.9 percent, 4.3 percent, 3.9 percent and 3.6 percent of total regional imports. The remaining seven countries have a combined total share of 7.2 percent of the region’s imports (WDI, 2023).

### **(iii) EAC Trade Statistics (2017-2020)**

The share of the East African countries contribution to global trade is minimal especially regarding exports. As shown in Table 2.3 calculations based on the WDI (2023) data, Kenya is the dominant

player in the region as it accounts for 38.9 percent and 46.6 percent of the regional exports and imports in the period 2017-2020. Tanzania is also a significant trade partner in the region coming second to Kenya and accounting for 24.5 percent of imports and 30.4 percent of exports from the region in the same period. Uganda comes third on the list with 19.6 percent of imports and 22.4 percent of exports of the region. Together both Burundi and Rwanda, account for 12.1 percent of imports and 8.3 percent of exports in the region with Burundi having the smallest trade share for both imports and exports (WDI 2023).

**Table 2.3: The share of EAC trade by member countries (2017-2020)**

	Export Share	Imports Share
<i>Burundi</i>	1.1%	5.5%
<i>Kenya</i>	38.9%	46.6%
<i>Tanzania</i>	30.4%	24.5%
<i>Uganda</i>	22.4%	19.6%
<i>Rwanda</i>	7.2%	6.7%

Source: (WDI 2023)

There are several noteworthy features of the EAC trade pattern. Firstly, although these countries come from the same region, they have different major trade partners. For example, although Rwanda and Burundi are neighboring countries and share a similar history, Burundi's main export markets are outside of Africa, while Rwanda's main export markets are other African countries. Second, the EU's 'Everything except Arms' initiative covers Burundi, Rwanda, Tanzania, and Uganda, but not Kenya. Finally, as provided for under AGOA, all EAC Partner nations have duty-free access to the US market except Burundi whose eligibility was revoked in 2016 (Umulisa, 2020).

**(iv): COMESA trade statistics**

Trade in COMESA member states is concentrated as seven of the members account for about 83.9 percent of the total intra-COMESA trade. Egypt, Kenya, and Zambia account for most of the trade. In 2021, Egypt's total trade value increased intra-COMESA trade by US\$ 26.3 billion followed by Libya (US\$16.6 billion), Tunisia (US\$15.7 billion), DR Congo (US\$12.2 billion), Zambia (US\$5.8 billion), Kenya (US\$4.2 billion) and Zimbabwe (US\$ 4.1 billion).

**Table 2.4: The share of COMESA exports by member countries (2017-2020)**

	<i>Exports</i>	<i>COMESA Export Share (%)</i>
<i>Burundi</i>	37,9	0,35
<i>Comoros</i>	5,3	0,05
<i>Egypt</i>	2861,4	26,28
<i>Libya</i>	244,81	2,25
<i>Kenya</i>	1595,53	14,65
<i>Malawi</i>	205,81	1,89
<i>Djibouti</i>	12,4	0,11
<i>Ethiopia</i>	460,53	4,23
<i>Eritrea</i>	1,19	0,01
<i>Eswatini</i>	227,77	2,09
<i>Madagascar</i>	79,46	0,73
<i>DRC</i>	917,89	8,43
<i>Mauritius</i>	238,75	2,19
<i>Rwanda</i>	626,68	5,76
<i>Somalia</i>	20,65	0,19
<i>Uganda</i>	600,93	5,52
<i>Zambia</i>	1234,13	11,33
<i>Tunisia</i>	848,48	7,79
<i>Seychelles</i>	20,26	0,19
<i>Sudan</i>	520,04	4,78
<i>Zimbabwe</i>	128,45	1,18

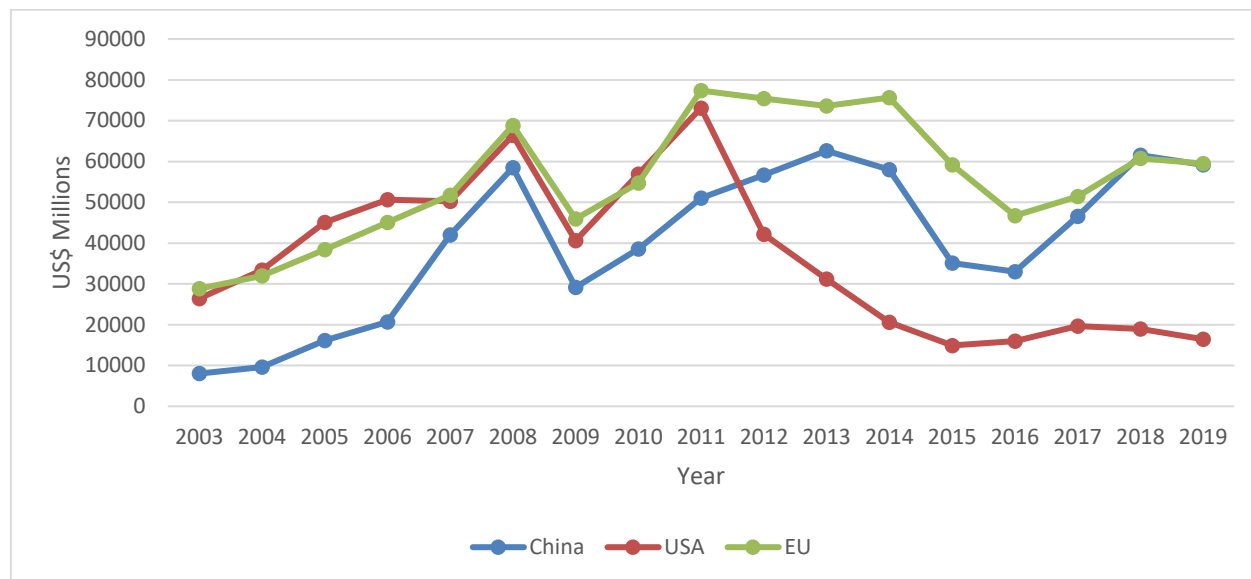
COMESA (2021)

## 2.6 China-Africa Trade

The SSA region has become a major focus of Chinese state-directed economic and trade policies during the last two decades. As a result, China's trade with countries in SSA has significantly increased. For example, China's total goods trade with SSA nations expanded by a staggering 1864 percent between 2003 and 2020 (Mvogo, 2021). Coupled with China's emergence as a key economic partner with SSA over the period, ties between the latter and both the European Union

(EU) and the United States (US) have weakened. China’s share of SSA’s total trade, both imports and exports, increased from 4 percent in 2001 to 25.6 percent in 2020 (Mvogo, 2021). This is in contrast with both the EU and the US where, during the same period, the share trade of EU total trade with SSA countries declined from 30.3 percent to 22.3 percent while that of the US declined from 15.5 percent to 5.6 percent (Mvogo, 2021).

**Figure 2.5: Share of Africa’s export by regional powers (%)**



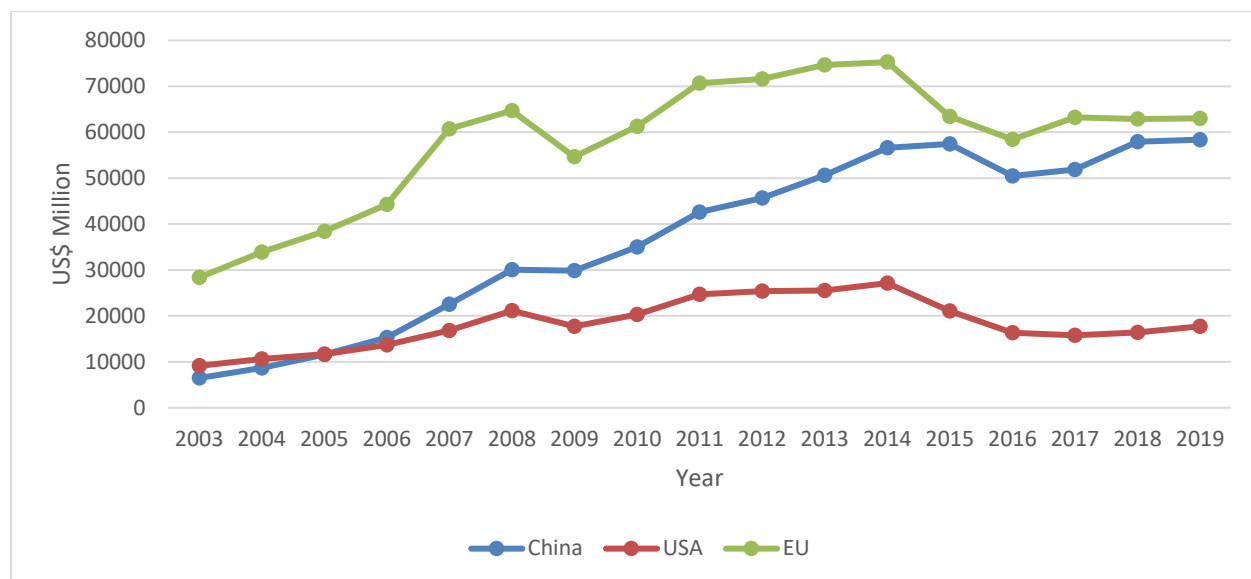
Source: IMF (2023)

Figure 2.5 indicates that since 2003, SSA exports to China has been increasing at a faster pace than the other two dominant bilateral partners, namely the EU and the USA, although for much of this period, EU's share of exports to Africa are higher. For example, in 2003, China received exports to the value of US\$ 8.021 billion compared to US\$26.420 and US\$28.816 billion that USA and EU received respectively. However, in 2008, SSA exports to China had increased to US\$58.471 billion, compared with US\$68.836 billion for both the EU and USA. This represents a growth of 630 percent of SSA exports to China, 160 percent for the USA and 140 percent for the EU between 2003 and 2008. Moreover, after 2008, the fortunes of the three regional heavyweights have taken different turns with the USA registering a steep decline of exports from Africa while that of China and the EU increased marginally over the same period. Between 2008 and 2019, China’s receipts of SSA exports have increased to US\$61.515 billion while that of the EU has declined to US\$59.525 billion as of 2019. The SSA exports to the USA have tumbled to US\$16.466 billion by 2019, the lowest over the review period. While the EU has traditionally been Africa’s largest trade



partner, China surpassed it in 2014 as the largest trade partner with the continent. In 2019, out of the 53 SSA countries, China was the largest export partner of 42 of them (IMF, 2023).

**Figure 2.6: Share of Africa’s imports by regional powers (%)**



Source: IMF (2023)

SSA imports from regional powers shows a similar trend to that of exports. For example, Figure 2.6 shows that, in 2003, China’s exports to Africa of US\$6.5 billion was the lowest as compared with US\$9.1 billion for the USA and US\$28.4 billion for the EU. However, in 2019, China’s Exports to SSA reached US\$58.4 billion while that of the USA stood at US\$17.7 billion. Although the EU is still the biggest source of imports to SSA, its margin with China has narrowed significantly as shown in Figure 2.10 that has been constructed from the IMF (2023) data.

### 2.6.1 Trade Flows in the SSA RTAs

Intra-African trade (exports and imports) accounted for only around 2 percent (US\$ 760 billion) of its total trade in 2019. (UNCTAD, 2019). This pales in comparison to other regions such as the America’s where intra-regional trade accounted for 47 percent of its total trade (US\$ 6240 billion), while in Asia and Europe, intra-regional trade accounted for 61 percent (US\$ 6801 billion) and 57 percent (US\$ 5140 billion) of total trade. Even in Oceania intra-regional trade was 7 percent (US\$ 481 billion) of total trade of the region. For the period 2000 to 2018, when disaggregated, the volume of exports from Africa to the rest of the globe ranged from 80 percent to 90 percent.

Table 2.4 shows the trade share of each of the selected African RTAs, both within the RTAs and globally (UNCTAD 2019). According to the data, intra-RTA trade in Africa, as well as trade between RTAs in the rest of the continent, is disproportionately lower than trade among RTAs in comparison to the rest of the globe. The EAC and COMESA had the biggest volume of trade with the rest of Africa (intra-Africa trade) accounting respectively for 10.1 percent and 18 percent of the trade in 2018. With 2.7 percent and 5.6 percent, respectively, the SADC and ECOWAS had the lowest intra-Africa trade in 2018.

**Table 2.5: Share of regional and global trade of African RTAs in 2018 (%)**

<i>RTA</i>	<i>Intra-RTAs</i>	<i>Rest of countries in Africa</i>	<i>Rest of the world</i>
<i>EAC</i>	11.5	10.1	78.4
<i>ECOWAS</i>	10.7	5.6	83.7
<i>SADC</i>	21	2.7	76.2
<i>COMESA</i>	8.1	18	64.3

Source: UNCTAD (2019)

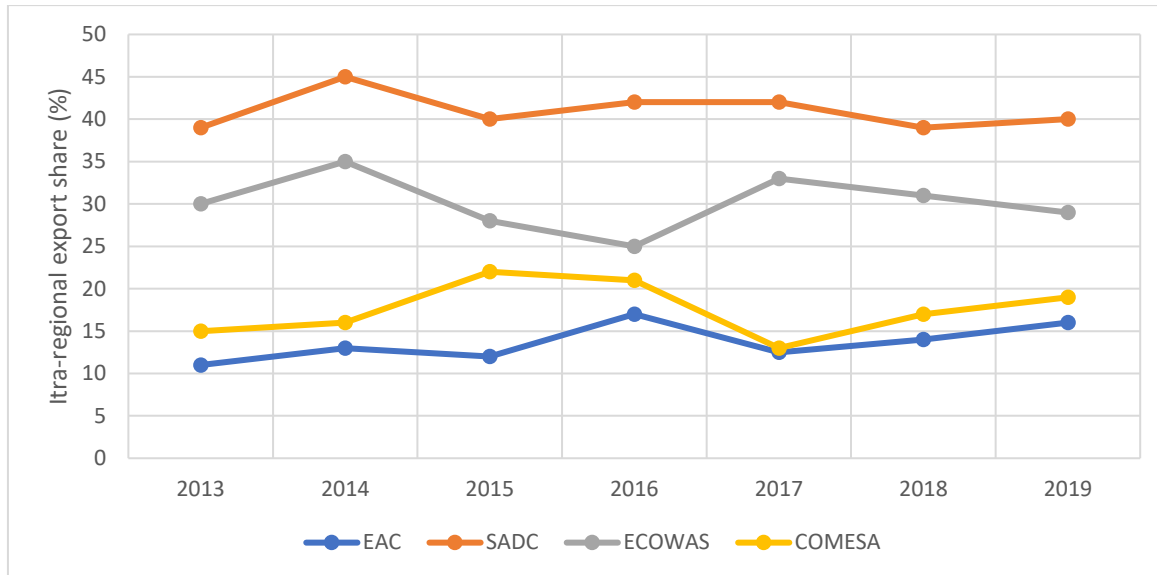
Table 2.4 also reveals that intra-RTA trade in 2018 was lowest for both ECOWAS and EAC who had a share of 10.7 percent and 11.5 percent respectively while intra-SADC trade was the highest amongst the four RTAs at 21 percent. In terms of trade with the rest of the world, ECOWAS had the biggest volume of trade, accounting for 83.7 percent of the bloc's total trade. SADC and EAC trade volumes with the rest of the world was comparatively lower but significant, with the former accounting for 76.2 percent of total commerce and the latter 78.4 percent in 2018.

### **2.6.2 Intra-regional exports of each RTA as a proportion of total SSA exports**

Figure 2.7 depicts the share of intra-RTA exports versus the RTA's total exports to SSA between 2013 and 2019. Among the three RTAs, SADC has the highest export ratio, while the EAC and COMESA had the lowest. Specifically, intra SADC exports amounted to over 40 percent of SADC's exports to Africa between 2013 and 2019 while intra EAC exports amounted to less than 20 percent of its exports to SSA during the period. This is mainly because the 16 SADC nations

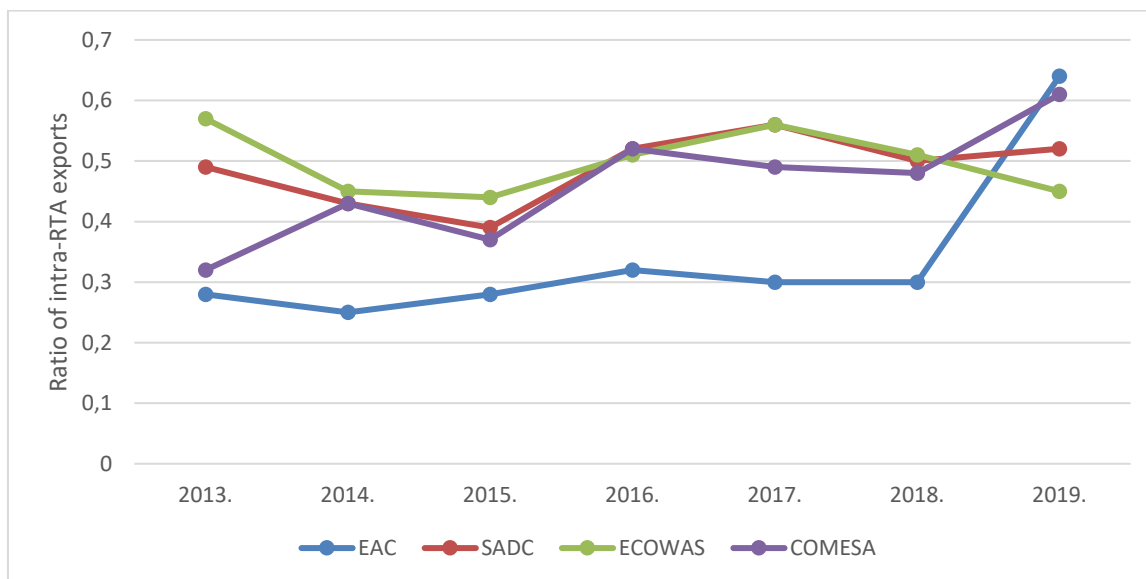
combined have more vibrant economies and natural resource endowments than the 5 EAC member countries. ECOWAS was moderate, higher than that of EAC but lower than that of SADC.

**Figure 2.7: Share of intra-regional exports as a percentage of total SSA exports**



Source: WITS (2021)

**Figure 2.8: Ratio of intra-RTAs exports to total RTAs trade (2013-2019)**



Source: WITS (2021)

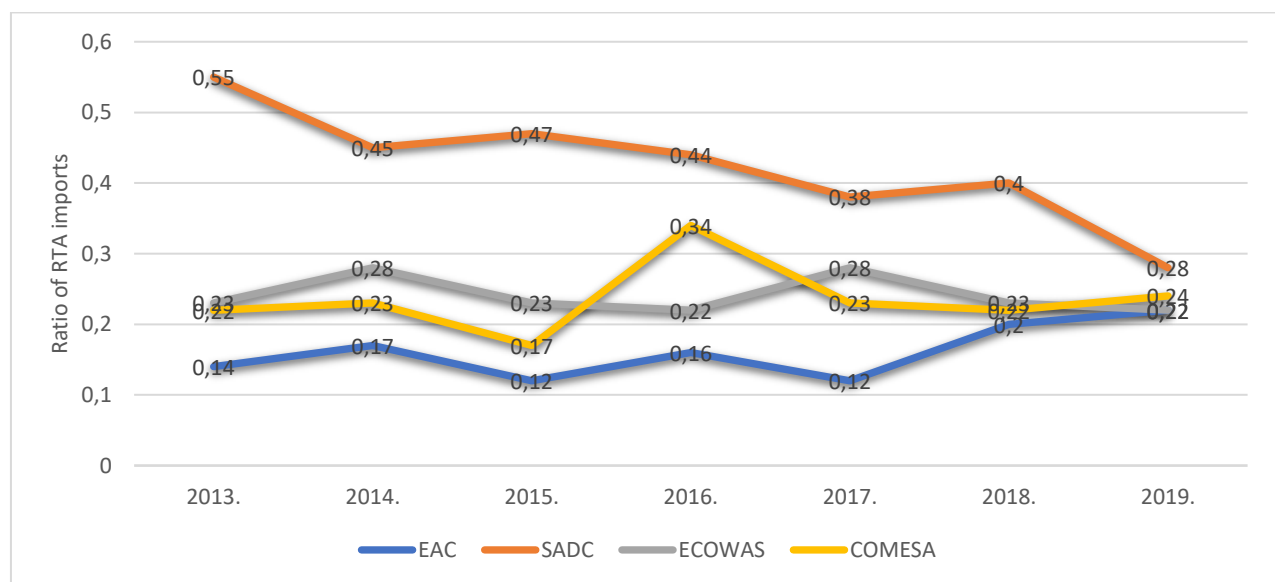
### 2.6.3 Intra RTA exports as a ratio of the RTA's total trade

Looking at the total trade of each RTAs, Figure 2.8 shows that, between 2013 and 2019, exports dominated trade in SADC, accounting for over 40 percent of total trade in most of the period. The EAC has the lowest export to total trade ratio, suggesting that it is less reliant on commodity exports than the other RTAs. The sudden rise of exports to total trade ratio for EAC in 2019 is an outlier and is not clear what caused the sudden surge.

#### 2.6.4 Intra-RTA import as a proportion of total SSA imports

SADC has the largest propensity to import in SSA, as seen in Figure 2.9. This is potentially due to several factors. First, South Africa is the region's dominating economy, with well-developed manufacturing, agriculture, and energy sectors compared to other major African economies (WITS, 2021). Second, imports are a measure of aggregate demand that is influenced by a region's GDP. Because SADC has the continent's largest regional GDP, it is destined to have the highest import ratio. As a result, SADC member nations import a substantial amount of goods from South Africa, increasing intra-SADC trade. The EAC, on the other hand, has the lowest import-to-total intra-RTAs ratio, because the area contains fewer nations with smaller GDPs (e.g., Rwanda, Burundi and Uganda). There is a marked decline of SADC share of imports in 2019, probably due to the effect of the Corona Virus pandemic which hit China in that year and China is the largest importer of goods, mainly mineral resources from the region.

**Figure 2.9: Intra-RTA imports as a proportion of total SSA imports**

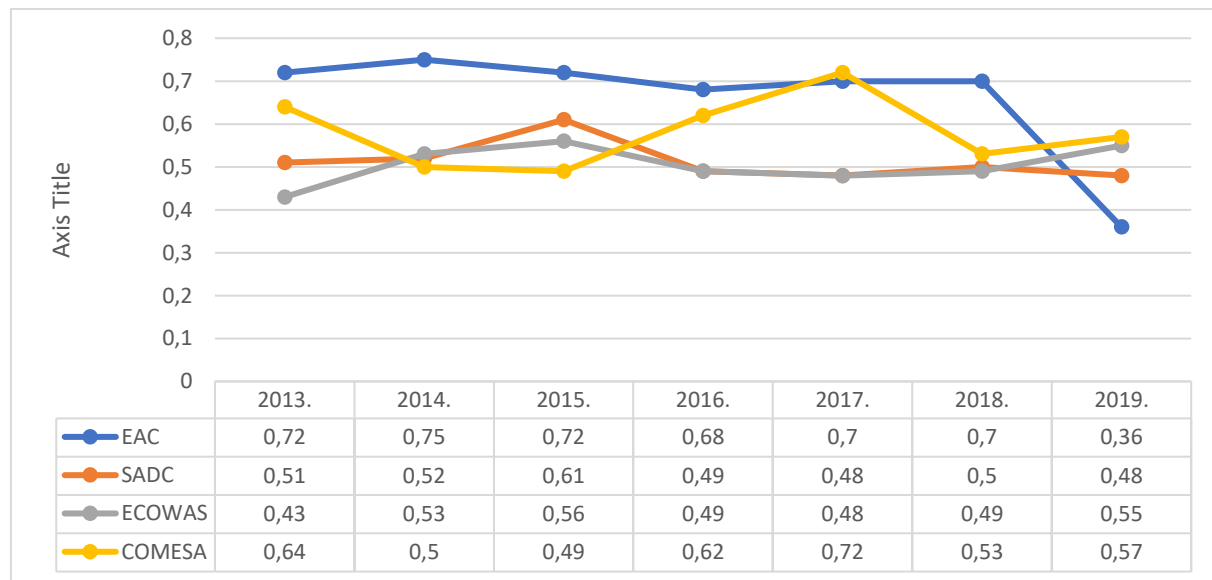


WITS (2021)

### 2.6.5 RTA imports as a proportion of RTA total trade

Figure 2.10 shows that the EAC is largely dependent on imports from within the EAC bloc. ECOWAS has a moderate intra-RTA to total trade ratio, indicating a balance between extra-regional imports and intra-regional exports.

**Figure 2.10: Imports of each RTAs as a proportion of its total trade**



Source: AU (2021)

## 2.7 Common Prospects of African RTAs

The engagement of ECOWAS in the 2010-2011 Ivory Coast conflict and the active involvement of the Intergovernmental Authority on Development (IGAD) in the settlement of the Somali crisis, demonstrate this. RTAs can influence the formation of security and peace by strengthening social, economic, and political fabric of regions. Law harmonization should result in fewer discrepancies in different countries' legal systems (UNECA, 2015).

African RTAs frequently consult and converse with one another. For example, in West Africa, there has been increasing interaction between ECOWAS and UEMOA, resulting in the establishment of a common plan of action on a variety of issues, such as trade liberalization and economic policy (UNECA, 2015). CEMAC and ECCAS have been working closely to coordinate

their programs in central Africa while, in Eastern and Southern Africa, IGAD has been implementing most of the COMESA plans. In addition, SADC and COMESA have jointly formed task teams to address similar challenges and invited each other to policy and technical meetings. COMESA and EAC have signed a memorandum of understanding to strengthen policy and program harmonization (Mayer & Thoenig, 2012).

Under the watch of the African Union (AU), African leaders signed a treaty in March 2018 that formed the African Continental Free Trade Area (AfCFTA), which includes 49 countries. Nigeria, which having first refused to sign the pact due to a lack of consultation and industries, did finally accede during a meeting in Niamey on the 27<sup>th</sup> of July 2019 (BBC, 2019). AfCFTA is the world's second largest free trade area after the WTO. The main purpose of the AfCFTA is to improve regional integration by encouraging economic cooperation and increasing intra-African by removing trade barriers (BBC, 2019). Other objectives of AfCFTA include allowing cross-border capital movement, creating a large export market, promoting regional industry, and laying the framework for the development of a continental customs union (Afreximbank, 2018). The agreement will be phased over time as countries harmonize tariff schedules, rules of origin, and service sector commitments (CFR, 2019).

## **2.8 Conclusion**

When African countries ratified the OAU charter in Ethiopia in 1961, the political features of regional agreements on the continent began to take shape and direction. Several RTAs have arisen since then in all of Africa's sub-regions: Southern Africa, the Arab North, East Africa, and West Africa. While the initial goal of African regional integration groups was to attain political independence, this goal has since been expanded to include economic motives as African states seek to develop their economies. These regional accords are in various phases of establishing free trade zones and customs unions. By joining the AfCFTA, all but six African countries have agreed to construct a continent-wide free trade zone. In Central Africa, ECCAS and CEMAC have been working to coordinate their programs, while in Eastern and Southern Africa, IGAD has been implementing most of the COMESA programs. SADC and COMESA have formed task teams to address similar challenges and invited each other to policy and technical meetings, while the EAC and COMESA have a MOU to strengthen policy and program harmonization.

The EAC and ECOWAS had the biggest volume of trade with the rest of Africa (intra-Africa trade) accounting for 10.1 percent of the trade in 2018. Intra-SADC trade was the highest amongst the three at 21 percent. In terms of trade with the rest of the world, ECOWAS had the biggest volume of trade, accounting for 83.7 percent of the bloc's total trade. SADC and EAC trade volumes with the rest of the world was comparatively lower but significant.

Exports dominate trade in SADC, accounting for over 40 percent of total trade in most of the period. The EAC has the lowest export to total trade ratio, suggesting that it is less reliant on commodity exports than the other RTAs. The literature search shows that the EAC is largely dependent on imports from within the EAC bloc, while ECCAS has the lowest intra-regional import-to-total-trade ratio. The limited trade of EAC is explained, firstly, by the fact that each country has different major trade partners. For example, although Rwanda and Burundi are neighboring countries and share a similar history, Burundi's main export markets are outside of Africa, while Rwanda's main export markets are other African countries. Given that latter's member states have close economic relations with France, their former colonial power, this means that the region is heavily reliant on imports from outside the bloc, primarily from Europe. The remaining RTAs, including SADC, AMU, and ECOWAS, have a moderate intra-RTA to total trade ratio, indicating a balance between extra-regional imports and intra-regional exports.

It has been shown that intra-African trade (exports and imports) account for only around 2 percent, which pales in comparison to that of other regions such as the America's where intra-regional trade account for 47 percent of its total trade, while in Asia and Europe, intra-regional trade account for 61 percent and 57 percent of total trade.

Literature has also illustrated the increasing dominance China in economic development of SSA. China's emergence as a key economic partner with SSA over the period has increased when ties between the latter and both the European Union (EU) and the United States (US) have weakened. For example, China's share of SSA's total trade, both imports and exports, increased from 4 percent in 2001 to 25.6 percent in 2020. This is in contrast with both the EU and the US where, during the same period, the share trade of EU total trade with SSA countries declined from 30.3 percent to 22.3 percent while that of the US declined from 15.5 percent to 5.6 percent.

## **CHAPTER 3: LITERATURE REVIEW**

### **3.1 Introduction**

This chapter begins with a thorough explanation of the concept of Regional Trade Agreements (RTAs), followed by a review of the literature on RTAs' impact in general and in Africa specifically. The literature review also examines empirical work on the gravity model as a research tool for evaluating the impact of RTAs on trade flows, as well as the factors that impact trade in African RTAs.

### **3.2 Theoretical Basis for RTAs**

Distance and Gross Domestic Product (GDP) are traditional trade parameters that correlate well with theories of international trade in a bilateral model with two countries. However, in a multilateral system where there are several partners and longer distances, it is difficult to measure the benefits using the two variables only (Chaney, 2014). RTAs frequently favor members over non-members since imports from fellow members replace imports from third-country producers. If member countries are not efficient in production, they end up paying more for the same commodities. Trade diversion is the term for this phenomenon, which has a negative impact on members' well-being (Chaney, 2014). Members of an RTAs, on the other hand, are likely to discriminate against non-members by offering preferential market access to fellow members, which is counter to neo-classical free trade principles (Kemp & Wan, 1976).

According to some studies such as Esteban & Anesa (2006) and Pant & Paul (2018), RTAs are operating sometimes contrary to World Trade Organization (WTO) principle of most favored nation. However, WTO accepts formations of RTAs as long as their activities are transparent. The WTO bases this exception on the fact that RTAs has become an important vehicle of economic growth and development especially in developing countries (WTO 2023). The Theory of Comparative Advantage underpins this way of thinking.



The first systematic analysis of the economic impact of RTAs was conducted in the 1950s by Jacob Viner, who examined whether a preferential trade agreement (PTA) enhances the welfare of member states (Viner, 1950). Balassa (1967) presents a trade creation version of Viner's notion of trade model, as well as ex-ante models capable of capturing dynamic implications of PTAs, supports Viner's position (Plummer, Cheong & Hamanaka 2010). To incorporate Balassa's estimations, Aitken (1973) developed a gravity model that added RTA dummy variables to evaluate ex-post consequences of a PTA on member countries after its commencement.

Most of the research on RTAs and regionalism has focused on the link between trade creation and trade diversion. Given Viner's (1950) finding that RTAs have ambiguous welfare effects, Kemp and Wan (1976) look at the welfare effects of a PTA on member and non-member countries and conclude that a customs union can improve welfare if the external tariff is adjusted to keep world prices constant. To put it in another way, if customs costs were low enough that international trade was unaffected, increasing trade among members would almost certainly follow, with no negative consequences for third parties. Kemp and Wan (1976) also discovered that RTAs members may improve their welfare if they could compensate for the losses sustained by specific members through lump-sum payments, and that RTAs would not necessarily harm global welfare. This fundamental principle has been applied to various types of RTAs, such as Free Trade Areas (FTAs) and partial liberalization (Panagariya & Krishna, 2002). (Neary, 2015).

### **3.3 Empirical Literature**

#### **3.3.1 The impact of RTAs in developed countries**

Almost all countries are engaged in one form or the other of regional integration, ranging from regional cooperation to political unions that involve a kind of transfer of sovereignty (Cered, Cernea, Msa & Orstom, 1987). By employing variants of the gravity model, most researchers conclude that RTAs are trade-creating rather than trade-diverting. Bergstrand (1985), for example, find that European trade blocs increased trade in the 1960s and 1970s. In the Asian and North American trading blocs, Frankel & Wei (1993, 1997) and Frankel (1997) observe evidence of trade formation while Soloaga & Winters (2001) observe trade creation in Latin America in the 1990s. RTAs, according to Frankel & Rose (2002), are often trade-creating. Chong-Wha (2008) finds significant trade-creating effects in five RTAs: the European Commission (EC), the Central

American Common Market (CACM), the Mercado Comn del Sur (the Common Market of the South) or (MERCOSUR), the Association of Southeast Asian Nations (ASEAN), and the South Pacific Regional Trade and Economic Cooperation Agreement (SPARTECA). However, the authors add that trade-creating effects in the EC and CACM are diminishing. Soloaga & Winters (1997) find evidence of trade diversion between the EU and the European Free Trade Association (EFTA) by analyzing annual non-fuel import data for 58 countries from 1980 to 1996.

If the case for RTAs membership is valid, then trade volume between member nations should increase. According to Adams, Dee, Gali and McGuire (2003), the EU, the North American Free Trade Agreement (NAFTA), and MERCOSUR have all failed to establish considerable intra-RTA trade. The EC was founded to have a positive and statistically significant influence on trade flows among member states (Aitken,1973; Abrams, 1980; Brada & Mendez, 1983). However, Bergstrand (1985) and Frankel et al. (1995) find insignificant effects. By treating FTAs as endogenous and introducing a dummy variable to represent the association's agreements, Frankel (1997) find positive and significant effects for the Andean Pact. Caporale et al., (2009) examine the effects of the 15 EU and the four Central and Eastern European Countries (Bulgaria, Croatia, the Czech Republic, and Hungary) on trade flows in their respective regions and find a positive and significant impact on trade flows exclusively between EU member states.

### **3.3.2 The impact of RTAs in Africa**

The role of RTAs in increasing trade flows among member countries has been questioned, not only in the case of Africa but also, in a global context (Jayjit, 2010). The drive by African countries to form, and belong to, different RTAs is mainly to expand trade, attain economies of scale and diversify the continent's economy (Economic Commission of Africa (ECA), 2010; Mayer, Martin, and Thoenig, 2010). Many studies on the impact of RTAs in Africa have found that RTAs have had insignificant, if not minimal, impact on the member countries, especially in terms of the increase in regional trade and, more importantly, in terms of improvement of economic development (Foroutan & Pritchett, 1993; Carrère, 2013; Behar & Cirera-i-Criville', 2013).

Several attempts have been made to explain the effectiveness of the regional trade collaboration on the continent. Ogunkola (1998), posits that the low levels of trade in ECOWAS is because the countries in the region are not exploiting their trade potential. Zannou (2010) uses a gravity model

to determine the factors that affect the functioning of ECOWAS countries and find that remoteness and isolation reduce the volume of intra-ECOWAS trade while proximity increase trade between member countries. To determine the factors that enhance intra-African trade, Longo & Sekkat (2001) use an augmented gravity model in a board dataset of 41 African states from 1980 to 1997. The authors find that lack of infrastructure, such as poor telecommunication networks and weak transport systems, hinder intra-Africa trade.

Numerous studies have examined the advantages of regional trade for African countries. A consensus of empirical research estimate that 12 percent of Africa's trade is intra-regional, compared to 22 percent for South America, 40 percent for North America, 50 percent for Asia, and 70 percent for Western Europe (Juma & Mangeni, 2018). According to Juma & Mangeni (2018), in SSA, the impact of the RTAs on member countries' economic development is not significant. Some scholars have put forward several reasons to explain the poor performance of African countries in this regard. For example, according to Barnekow & Kulkarni (2017), African countries' goods are less varied, and their infrastructure and trading systems are geared for intercontinental rather than intra-continental trade. Elbadawi and Soto (1997) & Yeats (1998) argue that RTAs in Africa have not always resulted in increased trade among the countries in the same economic block due to border restrictions, poor road networks linking these countries, and less-variation in the products being traded. Other studies show that economic integration between the SSA countries, in many cases, exhibit trade diversion effects (Hoekman & Nicita, 2011; Keen & Mansour, 2009; Longo & Sekkat, 2004). Other authors such as Claeys & Sindzingre (2003) and Shams (2003) examined specific influence of RTAs on intra-regional trade and found mixed effects of trade flows amongst member countries.

A variety of issues have been blamed for the limited benefits of African trade. According to Bhagwati and Panagariya (1993), as countries gravitate towards being members of RTAs in expectation of welfare gains, this strong desire results in countries engaging in diverse arrangements leading to what is referred to as the 'spaghetti bowl,' Bhagwati (1993:15). Cernat (2001) highlights the overlap of memberships, the spaghetti phenomenon, particularly in Eastern and Southern Africa, as a likely factor in the countries in these regions' low trade gains. Cernat (2001) also observe a strong case of trade creation among African RTAs member countries, which the author attributes to better trade facilitation among RTAs members in the region. As a result, RTAs in Africa tend to create rather than divert trade.

Poor performance of Africa's RTAs could also be attributed to the application of non-tariff barriers. These include stringent licensing rules and standardization criteria that restrict trade throughout the entire region. The SADC protocol, for example, has put in place sanitary and phytosanitary safeguards in individual member nations to protect the health of humans, animals, and farming products. Such measures have blocked exports of certain livestock products between member countries. The resultant distortions have resulted in price increases of imported goods in the SADC region. Moreover, High levels of intra-bloc trade, according to Magee (2003), may not be attributed solely to the development of preferential commercial agreements, but also to historical or political links between bloc members.

Contrary to the above studies, some scholars such as Ogunkola (1998), and Ngepah & Udeagha (2018; 2019) find a positive impact of RTAs in Africa. Indeed, the authors add that the benefits from regional trade agreements in member countries are not at the expense of trade with non-members. Claeys & Sindzingre (2003) examines the welfare effects of the ECOWAS and SADC RTAs and found that SADC exhibits positive welfare effects while in ECOWAS the welfare effects are more volatile. However, the most current research work on this subject by Fanta (2021) finds that RTAs in Southern and Eastern Africa reduce trade intra-regional trade.

### **3.4 Issues Surrounding the Estimation Techniques**

The mixed findings in the literature on the influence of RTAs on African trade flows can be attributed to discrepancies in research techniques. The ordinary least squares (OLS) approach is used in many studies on the trade within the RTAs (Moser & Rose, 2011). However, the OLS method has been shown to create inconsistencies in estimation and does not adequately address multi-collinearity and heterogeneity issues (Siliverstovs & Schumacher, 2009). Some studies have also employed computable general equilibrium (CGE) models (Hallaert, 2007).

Early studies of the benefits of RTAs on member countries, such as Frankel & Wei (1993) and Spilimbergo & Stein (1996) use computable general equilibrium (CGE) frameworks to investigate the welfare implications of RTAs. However, CGE models take an ex-ante approach, which involves quantifying the future effects of new trade policies and not past policies, and hence are not suitable for impact analysis of trade policies. Researchers such as Wan, Kemp & Winters (1997), Cernat

(2001), and Milner, Morrissey & McKay (2005) use neoclassical models to explain the welfare effects of RTAs on non-member countries using partial equilibrium methods. However, the neoclassical view which advocates unfettered free trade has been deemed ‘too radical’ to be applied in most countries (King, 2019). In fact, the World Bank and the IMF put the textbook neoclassical paradigm to the test in Latin America and Africa through Structural Adjustment Programs (SAPs) from 1980 to 1990 at a high cost of both growth and economic development in these regions. Public sector reforms, market liberalization, and institutional reforms were all part of long-term objectives of SAPs which aimed to promote production and resource mobilization (Kingston, 2011). According to Kingston (2011), SAPs sought to remove restrictions in the economy by establishing flexible prices as determined by the forces of the market. However, flexible prices negatively impacted other segments of the economy leading to dramatic drops in real wages and increased unemployment in several countries.

Gravity models, by contrast, take an ex-post (what happens after) approach to performing trade policy analysis. Some studies such as Carrère, (2004); Cernat (2001); Coulibaly & Fontagné, (2004); Kebré & Geda, (2007), relied on the gravity model advantages to conduct inter and intra-regional estimates of impact of trade flows. Due to its numerous applications, the gravity model has become a common modeling tool for examining effects of international trade (Ivus & Strong 2007). For instance, it makes it possible to give an account of bilateral, multilateral as well as internal trade (Cernat, 2001; Kebré & Geda, 2007). It can also be used to measure the effects of trade creation or trade diversion associated with the formation of customs unions, or to evaluate the degree of distortion of the exchanges (Ivus & Strong, 2007).

Although the gravity model has been criticized for lacking in economic theory, its robust results are consistent with facts and, hence, it is an ideal tool for explaining international trade flows (Kepaptsoglou, Karlaftis & Tsamboulas, 2010). However, most studies that have used gravity models have mainly focused on country pairings (Aitken, 1973; Clarete, Edmonds & Wallack, 2002; Deluna, 2013; Dembatapitiya & Weerahewa, 2015; Wang & Badman, 2015). A substantive number of researchers have also used the model to examine the impact of regional trade agreements on trade flows between member countries (Frankel & Wei, 1997).

However, many of these studies have focused mainly on RTAs and regional economic communities (RECs) in Northern America (NAFTA), Western Europe (EU) and East Asia (ASEAN) (Aitken

1973; Dabrowski 2010; Korinek & Melatos 2009; Muhammad & Yucer, 2010). Nevertheless, a few researchers have used the gravity model to investigate trade flows in Africa. These studies, though, focus mainly on the Maghreb region (Carrère 2004) and Middle East, Egypt, Israel, Jordan and Syria (Ekholm, Torstensson & Torstensson, 1996). Few research has focused on the influence of RTA in SSA to date (Korinek & Melatos, (2009). Ngepha and Udeagha (2019) investigate the role of multiple membership of RTAs on trade in SSA and find that overlapping memberships enhance trade in African countries. However, the focus of the authors is Africa-wide while the focus of this research is on Sub-Saharan Africa. Fanta (2021) investigates specifically the impact of overlapping RTA memberships of four RTAs in Southern and Eastern Africa, namely Intergovernmental Authority for Development (IGAD), COMESA, SADC and EAC. The author finds that overlapping membership negatively impacts intra-regional trade in the four RTAs. Hence, there are different findings on the impact of overlapping memberships of RTAs in Africa by the most recent studies indicating that further research involving different RTAs in the region should be conducted. The research at hand differs from the two mentioned above by investigating the role of overlapping of RTAs, specifically involving SADC, EAC and COMESA. ECOWAS does not overlap with other RTAs and hence will not form part of the investigation on overlapping RTAs. As a result, this is the starting point for this research, which will focus on all current RTAs in SSA. A summary of the examined studies on the impact of RTA membership on trade flows can be found in Table 3.

**Table 3.1: Summary of reviewed literature**

Author	Data and sample	Dependent variable	Trade variables	Other explanatory variables	Estimation technique	Conclusion
<b>Frankel &amp; Wei (1993)</b>	Trade data of EU, MERCOSUR and ASEAN 1970-92	Exports	GNP, Distance, Adjacency (common border), language,	Dummies for different FTAs, per capita GNPs, Remoteness	Modified gravity model	EC and East Asia have increased trade with each other, and at the same time, increased trade with non-member
<b>Foroutan &amp; Pritchett. (1993)</b>	Sub-Saharan Africa, (1975-1990)	Total Trade		GDP, GDP per capita, dummies for islands, common	Traditional gravity model	The gravity model is a good predictor of the low level of intra-SSA trade.

				border, RTAs, language		
<b>Bhagwati &amp; Panagariya. (1996)</b>	Theoretical discussion on (PTA), free trade area (FTA) and customs union (CU)	Exports	Imports	GDP, Distance, dummies for regions and bilateral trade	Meta-analysis of the impact of CUs on welfare in FTAs	The various theories have failed to capture the relationship between regional integration and liberalization of trade
<b>Frankel (1997)</b>	Trade in all global trading covering 63 countries 1965-1994	Total merchandise trade	GNP, GNP per capita	Population, distance, linguistic, dummies for regions e.g., WE, WH, EC	Gravity equation using pooled data	Regionalism tends to concentrate trade within blocs if there is no reduction in barriers between blocs
<b>Yeats (1998)</b>	Mercosur countries, 1979-1994	Regional Orientation Index, Revealed Comparative Advantage	Exports, Imports, World Exports	Intensity of Industry, Tariffs, NTBs	Intensity of the Trade Index (ITI)	Regional preferences can be detrimental to both member and non-member countries
<b>Chang &amp; Winters. (1999)</b>	MERCOSUR (between Argentina, Brazil, Paraguay, and Uruguay). (1989-1996)	Prices	Imports, exports	Input costs, exchange rates and tariffs	Parsimonious model of export pricing	Regional integration does affect traded goods Prices by increasing the latter for non-member exporters
<b>Frankel &amp; Rose (2000)</b>	200 countries, 1970-1995	GDP per capita	Total trade	Exports, Imports, investments common border, language, dummies for RTAs	Augmented gravity equation	Currency Union leads to more than tripling of trade amongst members of the bloc
<b>Cernat (2001)</b>	100 countries, 1994-1998.	Exports		Common border, language, distance, GDP, GDP per capita,	Expanded gravity model	There is no evidence that South-South RTAs are more trade diverting than North-North RTAs

				dummies for RTAs		
<b>Soloaga, &amp; Winters, (2001)</b>	Trade data of EU, EFTA, ANDEAN, CACM, LAIA and MERCOSUR and ROW spanning 58 countries 1980–1996	nonfuel imports data	Exports, GDP, Distance,	Tariffs and NTBs	Augmented gravity model	Mixed results: No indication that regionalism boost intra-bloc trade; There is trade diversion only for the EU and EFTA: Latin American trade liberalization in the 1990s had a positive impact on bloc members' imports
<b>Baier &amp; Bergstrand (2002)</b>	European Economic Community (EEC) and Central American Common Market (CACM) between 1960 and 2000	Exports		GDP, Distance, dummies for N-N, S-S and N-S	Nonparametric matching econometrics	The authors find positive long-run impacts on trade EEC and CACM between 1960 and 2000
<b>Anderson &amp; van Wincoop. (2003)</b>	Trade data of US and Canada and 22 industrial countries	Exports	Exports	GDP	Augmented gravity Equation, dummies for Canadian provinces and US states	Borders reduced trade between the US and Canada and between US and industrialized countries by about 44% and 30% respectively
<b>Carrère (2004).</b>	Sub-Saharan Africa, 1962-1996	Imports	Exports	GDP, population, transport costs, distance, real exchange rate	An augmented gravity model	RTAs in Africa have led to increased trade between members states
<b>Baldwin &amp; Taglioni. (2006)</b>	EU countries data, 1980-2004	Exports	Bilateral imports, bilateral exports	GDP, Distance, Dummies for distance, countries	Gravity model using both OLS and panel data estimators	The authors find insignificant effect of the Euro on trade flows in most of the member countries



<b>Buys, Deichmann, &amp; Wheeler. (2006)</b>	IMF Directions of Trade, 2000-2003 merchandise imports/exports for all African countries	Total Trade,	Exports, imports	GDP, Distance, governance index, quality of roads index	Gravity trade model	If road networks are improved, almost half of increase in exports is between major regions (West, Central, East, Southern, South Africa)
<b>Hallaert (2007)</b>	Madagascar and SADC, 2006-2012	Economy-wide	Economy-wide	Economy-wide	CGE model: Global Trade Analysis Project (GTAP)	The SADC FTA has limited impact on Madagascar's real total imports
<b>Coulibaly (2009)</b>	7 RTAs: (ECOWAS and SADC) in Africa; (AFTA and SAPTA) in Asia and (CACM, CAN and MERCOSUR) in Latin America,	Exports	Exports	Distance, GDP, Real Exchange rates, population	Combination of a gravity model and kernel estimation techniques	Except for SAPTA, all the other RTAs have contributed to international trade over the estimation period
<b>Freund &amp; Rocha (2011)</b>	Sample of 44 Sub-Saharan Africa countries	Sub-Saharan African Exports		GDP, population, Distance, trade costs completing documentation, inland transit delays and customs and ports times. Dummies for landlocked and remoteness	Augmented gravity equation	Reduced duration of transportation over land in SSA leads to a decrease in importing-country tariffs
<b>Carrère, de Melo, &amp; Wilson (2013)</b>	124 countries over the period 1970-2005	Imports		GDP, Distance, dummies for developing	Cross-section and panel estimate of the gravity equation	Distance mainly impacts trade in low-income countries but not in richer countries

				countries, prices		
<b>de Melo, J. &amp; Tsikata (2014)</b>	Trade in African RTAs (EAC, COMESA, ECOWAS, PAFTA, SADC, UEMOA. (1970-2012)	Imports	Language, GDP, distance	Colonial history	Modified gravity model	There is uneven distribution of benefits across partners
<b>Dematapiti ya&amp;Weerahe wa (2015)</b>	South Asia bilateral trade for the year 2012	Exports	GDP, Imports	Distance, common language, colonial ties,	Gravity model of international trade using Ordinary Least Squares	Common language, colonial history, and membership of WTO positively affect exports
<b>Barnekow, &amp; Kulkarni (2017)</b>	15 OECD countries,	Export flows	Imports, Tariffs and NTBs	GDPs for both source and destination markets, distance and error terms, Dummies for RTAs	Augmented Gravity Equation using General Equilibrium of World Trade Model	RTAs do not lead to greater welfare. There is no strong positive result that RTAs are welfare-enhancing
<b>Ngepah, &amp; Udeagha, (2018)</b>	53 African countries, 1995-2014	Total Trade	Exports	Population, GDP, Common Border, language	Gravity model using the Eicker-White robust covariance Poisson pseudo-maximum likelihood	RTAs in SSA do not lead to trade diversion with non-members

### 3.5 Chapter Conclusion

This chapter discussed the theoretical basis for RTAs and the empirical literature on the impact of RTAs globally and with specific focus on Africa. The chapter reveals that the impact of RTAs on trade is mixed. These mixed results are attributed to several factors, including the use of different methodological approaches and weaknesses in the sampling methods of the previous studies.

Many of the studies that examined the benefits of RTAs used the gravity model. The studies have also focused mainly on country pairings, and predominantly on RTAs or RECs in North America (NAFTA), Western Europe (EU) and East Asia (ASEAN). The few studies that examined RTAs in Africa using the gravity model have focused predominantly on the Arab North. Very few studies, however, have focused on the effect of RTAs in Sub-Saharan Africa. Unfortunately, the findings of the studies that have been conducted on the influence of RTAs on intra-regional trade in SSA countries are inconclusive, and because, the data collected in these studies only covers the period from 1995 to 2014, these results are outdated. In addition, many of the scholars who have analyzed the effects of belonging to RTAs in Africa have used analytical processes that may be suitable for European and Asian countries, but do not account for factors that are specific to African countries. Colonialism, for example, is a major factor that has influenced, and continues to influence, the volume and direction of trade in most, if not all African states.

The methodologies and procedures used in this study to fill the gap in the literature on this topic are detailed in the following chapter.

## **CHAPTER 4: METHODOLOGY**

### **4.1 Introduction**

The gravity model is the most common model for determining the impact of a trade agreement(s) on cross-border export flows. The model is based on Newton's (1687) law of gravity which posits that the force of attraction between two objects is proportional to the product of their masses divided by the square of the distance between them (see Lerner, 2001).

The gravity model has since been used in a variety of topics, including in tourism, migration, social interaction, and foreign direct investment. Tinbergen (1962) pioneered gravity equations to evaluate the influence of trade agreements on cross-national trade flows over time. Since then, the model has gained popularity as a tool for measuring the impact of international trade agreements on both member and non-member countries. The gravity model, the research design, sampling technique and model specification are explained in this chapter.

### **4.2 Consideration of overlapping RTAs**

Although some studies employ total trade as the dependent variable in gravity models, it may be difficult to distinguish the contributions of exports or imports to total trade. Hence, following Anderson & van Wincoop (2003), this study uses exports as a proxy for trade flows (dependent variable) to investigate the impact of RTAs on intra-RTAs exports as well as on intra-SSA exports. The independent variables included in this study are the GDP for importing countries, the GDP for exporting countries, China's GDP, distance between two countries. In addition, this study includes dummy variables to capture membership to a regional trading bloc (COMESA, EAC, ECOWAS and SADC).

The choice of the three RTAs is informed by the fact that most of the countries in SSA belong mainly to COMESA, EAC, ECOWAS and SADC. Dummy variables are also included to account for (i) the existence of common factors specifically, language, and (ii), overlapping membership.

The latter is necessary as it is important to examine the possible effects of overlapping memberships on intra-regional export flows and on the integration efforts. Overlapping memberships refers to a situation in which a country belongs to more than one RTA. Overlapping membership in the context of this study is observed for the pairings of EAC and SADC; SADC and COMESA as well as EAC and COMESA. In this case, three dummy variables are used to account for the overlap. The dummy variables will take the value of 1 if a country belongs to more than one RTAs and 0 otherwise.

### **4.3 Estimating the Gravity Equation**

#### **4.3.1 Theoretical foundations**

Gravity models are commonly used to evaluate bilateral trade flows (imports and exports) between RTAs member nations and non-RTA members (Eichengreen & Irwin, 1998). Tinbergen (1962) was the first to apply a gravity model to estimate the pattern of international trade flows. However, his initial work lacked a theoretical underpinning.

The gravity model has subsequently been improved as a tool for assessing the effects of RTAs (Anderson & van Wincoop, 2003; Bayoumi & Eichengreen 1995; Bergstrand 1985). Anderson (1979) based his version on the constant elasticity of substitution (CES) spending model and gave the first theoretical support for the gravity model. Helpman & Krugman (1985), Bergstrand (1985), and others have since advanced the theoretical basis. For example, the current variations of CGE models incorporate the effect of technological flows that allow for innovation spread and productivity in the economy (Nilsson, 2019). However, the scarcity of data makes these models difficult to use.

The gravity model should be of significant import to policymakers since it enables them to estimate trade effects of numerous trade policies. The development of the gravity model is the result of numerous research efforts. A substantial body of literature has provided the model with a strong theoretical foundation. However, there is no agreement on the model's appropriate econometric estimation methods.

### 4.3.2 Issues of Endogeneity

According to Skrivanek (2009), a variable is considered endogenous when a change to its value depends on the changes in the values of other variables in the economic model. On the other hand, an exogenous variable is one whose value is predetermined or is affected by factors outside the model. The issue of endogeneity and selection bias that arise from the use of RTAs dummy variables have not been adequately addressed by many of the studies that use gravity models. Dummy variables allow for the utilization of a single regression equation to represent features that do not have distinct values (such as tribe, color, brand, gender, or area in this case), thus removing the need to create individual equation models for each grouping (Skrivanek 2009).

To account for common features of member countries, most empirical studies that have examined RTAs treat RTAs as endogenous variables and not exogenous variables (Baier & Bergstrand 2002; Magee, 2003). On the other hand, some studies (Deardorff, 1998; Pant & Paul 2018) assign dummy variables to represent the effect of RTAs on bilateral trade flows. RTA dummy variables are not supposed to be exogenous random variables because their values depend on changes of other factors within the region or the model.

The decision a country makes on whether to join an RTA is informed by different desired outcomes such as: expansion of a domestic market to realize economies of scale, leveraging geographical advantages to reap the benefits of cross border trade and the attainment of macroeconomic discipline. According to Pant & Paul (2018), these non-observable elements may produce an endogeneity bias in estimates of RTAs' influence on a country's trade. Bayoumi & Eichengreen (1995) attempt to avoid the impact of unobservable elements by running the gravity model in first-difference mode, which causes unobserved features of trade partners, that are consistent across time, to disappear. However, controlling for time-varying omitted variables has proven to be a challenge in this method.

The panel data estimation used in this study is based on Anderson & van Wincoop's (2003) approach. An endogenous variable in econometrics is any variable in the regression model that is correlated with the error term, whereas an exogenous variable is one that is not correlated with the error term. For the model to be estimated the qualitative characteristics are accounted for in this

study as dummy variables that represent the member states, common language, distance, and export performance. The coefficients of the RTAs, EAC, ECOWAS and SADC dummies capture, not only the effects of the RTAs agreements but also, the likelihood that most of the intra-RTA trade are due to some cultural relationships between bloc members (MacPhee and Sattayanuwat, 2014).

### **4.3.3 Selection bias**

Gravity models are relevant to the sample of nations used in the investigation of RTA effects (Haveman and Hummels, 1998). The authors demonstrate that exclusion of an RTA variable in gravity models lead to spurious results for individual countries. Yamarik and Ghosh (2004) also state that gravity model outcomes are highly dependent on the variables used in the regressions. Most of the studies (de Melo & Tsikata 2014; de Sousa & Lochard 2010; Melitz & Ottaviano 2008; Ngepah & Udeagha, 2018) that have examined the impact of trade flows on membership to RTAs have done so by investigating the impact of individual RTAs and have not compared the impact of different RTAs in one study. This is a gap that this current study attempts to examine. Five, fourteen, fifteen and twenty-one SSA countries belong to EAC, SADC, ECOWAS and COMESA. Therefore, in this study, a representative sampling of 42 SSA countries in the four RTAs (EAC, SADC, ECOWAS and COMESA) will be used to examine the effects of the RTAs on their exports in SSA.

To account for overlapping RTAs membership, the basic gravity model will be augmented by including dummy variables to control for this aspect. Following Jan van Garderen and Shah (2002) additional dummy variables will be included to control for common language, border, culture and colonial history, but for this study the additional dummy variable will be the common language and overlapping RTAs membership.

Many studies utilize the total trade as a proxy for international trade (Rahman, 2003), while others such as Adams, Dee, Gali, & McGuire (2003) use the value of export as proxy for the dependent variable, and the simple reason of using exports as a dependent variable instead of total trade is to allow for the separation of export and import diversion. One-way trade (either exports or imports) has also been suggested by Baldwin & Taglioni (2006), and this is the technique adopted in this study, where exports is used as the dependent variable.

#### **4.3.4 Consideration of the impact of China on the RTAs trade**

China is carving out a dominant influence in almost all African countries through trade, investment, and aid assistance. Although Western interests and companies still maintain a dominant position in Africa, China's presence has been expanding at a very rapid rate (Songwe, 2019). According to the General Administration of Customs of China (2019), China's overall trade volume with Africa was valued at US\$ 204.19 billion in 2018, up 19.7 percent from the previous year. The growth of Chinese trade on the continent exceeded the overall growth rate of SSA's foreign trade in 2018 by 7.1 percent. Therefore, given this, this study seeks to capture the impact of Chinese influence in SSA trade activities by including China's GDP as an independent variable.

#### **4.3.5 Sampling Technique**

This study focuses on exports among member countries of COMESA, ECOWAS, EAC and SADC regions in Africa. There are a total of 42 countries within the four RTAs. Rwanda, South Sudan, Kenya Uganda, Burundi and Tanzania are members of the East African Community (EAC), which is in the East Africa's Great Lakes region. The group was created in 1967, disbanded in 1977, and then resurrected in 2000. The study will concentrate on the countries of the restructured EAC. South Sudan is excluded from the sample size owing to lack of data. ECOWAS, which was established in 1975 and has 15 members, namely Mali, the Gambia, Sierra Leone, Ghana, Nigeria, Côte d'Ivoire, Benin, Guinea, Liberia, Niger, Guinea Bissau, Burkina Faso, Togo and Cape Verde. To account for late arrivals, the analysis will use 1977 as the year ECOWAS was founded. Starting from the year ECOWAS was founded will exclude member countries that joined after 1975, the year ECOWAS was founded. Data for Liberia is not available for the period considered in this study and therefore, Liberia is excluded from the sample. Founded in 1992, SADC has fourteen members, namely Botswana, the Democratic Republic of Congo, Angola, Lesotho, Tanzania, Madagascar, Zambia, Malawi, Seychelles, Mauritius, Namibia, South Africa, Mozambique, Eswatini and Zimbabwe. Due to unavailability of data for the period 1986 to 2021 Malawi is excluded from the sample. COMESA comprises of 21 members (Egypt, Libya, Tunisia, Sudan, Ethiopia, Eritrea, Comoros, Djibouti, Somalia, Uganda, Rwanda, DRC, Kenya, Zambia, Malawi, Zimbabwe, Seychelles, Madagascar, eSwatini, Burundi and Mauritius)



The 42 member countries that make up the EAC, ECOWAS and SADC regional blocs represent 77 percent of all the countries in Africa.

#### 4.4 The Model

Tinbergen (1962) first utilized the gravity model to investigate the factors that influence trade flows between countries. Tinbergen employed exports as a proxy for trade, the dependent variable, and the GDP of both nations, as well as their cultural and historical backgrounds, as explanatory variables (Caporale et al., 2009; Sichei, et al., 2005).

The basic gravity equation is written as follows:

$$X_{ij,t} = \beta_0 \left( GDP_{it}^{\beta_1} GDP_{jt}^{\beta_2} EXCR_{ijt}^{\beta_3} Dist_{ijt}^{\beta_4} \right) \varepsilon_{ij} \dots \dots \dots (1)$$

where:

- $X_{ij,t}$  = value of exports from the  $i_{th}$  country to the  $j_{th}$  country, at time  $t$ ;
- $\beta_0$  captures the rate at which exports changes due to changes in the independent variables;
- $GDP_{i,t}$  = GDP of  $i_{th}$  exporting country;
- $GDP_{j,t}$  = GDP of the  $j_{th}$  importing country;
- $Dist_{i,j}$  is the distance between the importing country and exporting country;
- $EXCR_{ijt}$  is the relative price of goods at time  $t$  represented by exchange rates between the exporting country and the importing country;
- $\varepsilon_{ij}$  = Random error.

The intuitive assumption that can be drawn from this augmented gravity model is that (i) larger countries (in terms of the size of the economy or population) trade more than smaller counties, and (ii) that distance and the presence of cultural conflicts tend to impede trade. Owing to its simplicity and limitation, the Tinbergen's augmented model would be inadequate to analyze complex trade flows between members of RTAs.

Therefore, this study builds on Tinbergen's (1962) initial model and follows Dembatapitiya & Weerahewa (2015) by including China's GDP, dummy variables that capture the effect of

language, overlapping COMESA, EAC, ECOWAS, SADC membership(s) and the influence of China's economy on RTA export performance.

The baseline model is thus written as follow:

$$EXP_{ij,t} = \beta_0 (GDP_{it}^{\beta_1} GDP_{jt}^{\beta_2} EXCR_{ijt}^{\beta_3} Dist_{ijt}^{\beta_4} Comlang_{off_{ijt}}^{\beta_5} COMESA_t^{\beta_6} EAC_t^{\beta_7} ECOWAS_t^{\beta_8} SADC_t^{\beta_9} \beta_t^{\beta_{10}}) \quad (2)$$

Then equation (2) will be written as a linear equation as follows:

$$LNEXP_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln EXCR_{ijt} + \beta_4 \ln Dist_{ijt} + \beta_5 \ln Comlang_{ijt} + \beta_6 COMESA + \beta_7 EAC_t + \beta_8 ECOWAS_t + \beta_9 SADC_t + \varepsilon_{it} \quad (3)$$

Equation three (3) is then expanded to capture overlapping RTA memberships and the China's GDP through an interactive term between China's GDP and RTA membership. The augmented equation is then written as follows:

$$EXP_{ij,t} = \beta_0 (GDP_{it}^{\beta_1} GDP_{jt}^{\beta_2} EXCR_{ijt}^{\beta_3} Dist_{ijt}^{\beta_4} Comlang_{off_{ijt}}^{\beta_5} COMESA_t^{\beta_6} EAC_t^{\beta_7} ECOWAS_t^{\beta_8} SADC_t^{\beta_9} OVEACSADC_t^{\beta_{10}} OVEACCOMESA_t^{\beta_{11}} OVSADCCOMESA_t^{\beta_{12}} CHNGDP * RTA_t^{\beta_{13}} \beta_t^{\beta_{14}}) \dots \dots \dots (4)$$

where:

- $\beta^i$  are the parameters to be estimated,
- $i = \text{exporting countries}$ ;
- $j = \text{importing countries}$ ;
- $EXP_{ij,t}$  is the exports of country i to country j at time t;
- $GDP_{it}$  is the GDP, of the exporting country at time t;
- $GDP_{jt}$  is the GDP of the importing country at time t;
- $CHNGDP_t$  is China's GDP, at time t;
- $EXCR_{ijt}$  relative price of goods at time represented by exchange rates between the exporting country and the importing country;
- $Dist_{ijt}$  is the distance in kilometers between the exporting country and country importing;
- $Comlang_{off_{ijt}}$  is the common language dummy;
- $COMESA$  is the Common Market for the Eastern and Southern Africa dummy;
- $EAC$  is the East African Community RTA dummy;
- $ECOWAS$  is the Economic Community of West African States RTA dummy;

- *SADC* is the Southern African Development Community RTA dummy;
- *OVEACSADC* is the overlapping membership dummy between EAC and SADC;
- *OVEACCOMESA* is the overlapping membership dummy between EAC and COMESA;
- *OVSADCCOMESA* is the overlapping membership dummy between SADC and COMESA;
- *CHNGDP\*RTA* is the interactive term between China's GDP and the RTA membership;
- Lastly, a  $\varepsilon_{ij}$  the random error. The error term  $\varepsilon_{ij}$ , is broken into a two-way error component model,  $\varepsilon_{ijt} = \mu_j + v_{ijt}$ . Here,  $\mu_j$  represents a country's specific effects while  $v_{ijt}$  is the white noise residual.

Equation (4) is linearized as follows:

$$LNEXP_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln(EXCR_{ijt}) + \beta_4 \ln Dist_{ijt} + \beta_5 \text{comlang}_{ijt} + \beta_6 COMESA + \beta_7 EAC_t + \beta_8 ECOWAS_t + \beta_9 SADC_t + \beta_{10} OVEACSADC_t + \beta_{12} OVEACCOMESA_t + \beta_{13} OVSADCCOMESA_t + \beta_{14} CHNGDP_t * RTA + \varepsilon_{it} \dots \dots \dots (5)$$

#### 4.5 A Priori Expectations

The following results are expected:

- The coefficients of exporter and importer GDPs are expected to have positive signs; this means that the larger an economy (large GDP) the more it imports, or the larger the exports of its bilateral trade partner.
- Distance is related to the remoteness of a destination. It is also positively correlated to cost of transport; the further trading partners are from each other geographically, the lower the trade flows between them, implying that the sign of the coefficient of distance should be negative.
- Same language strengthens cultural ties and thus enhances trade between nations. As a result, a positive coefficient for shared language is expected.
- The coefficient of the exchange rate is expected to be negative. The bigger the coefficient of the exchange rate, the smaller the value of exports of the exporting country.

**Table 4.1: Variables used in the panel model**

<i>Variable</i>	<i>Measurement</i>	<i>Source</i>
<i>Exports</i>	<i>% GDP</i>	<i>World Bank</i>
<i>Exporting country GDP</i>	<i>% GDP</i>	<i>World Bank</i>
<i>Importing country GDP</i>	<i>% GDP</i>	<i>World Bank</i>
<i>China GDP</i>	<i>% GDP</i>	<i>World Bank</i>
<i>Distance</i>	<i>Kilometers</i>	<i>Cpii</i>
<i>Exchange rate</i>	<i>Dollars</i>	<i>Yahoo Finance</i>
<i>Language</i>	<i>N/A</i>	<i>Cpii</i>
<i>COMESA</i>	<i>N/A</i>	<i>Dummy variable</i>
<i>EAC</i>	<i>N/A</i>	<i>Dummy variable</i>
<i>ECOWAS</i>	<i>N/A</i>	<i>Dummy variable</i>
<i>SADC</i>	<i>N/A</i>	<i>Dummy variable</i>
<i>OVEACSADC</i>	<i>N/A</i>	<i>Dummy variable</i>
<i>OVEACCOMESA</i>	<i>N/A</i>	<i>Dummy variable</i>
<i>SADCCOMESA</i>	<i>N/A</i>	<i>Dummy variable</i>
<i>CHNGDP*RTA</i>	<i>N/A</i>	<i>Interactive term</i>

#### **4.6 Data and Data Sources**

Export data from SSA countries to their trading partners within the SSA region is sourced from IMF trade statistics and UN Comtrade database. GDP data for exporter and importer countries, as well as China's GDP is obtained from the World Bank's World Development Indicators (WDI) database. The data of exchange rate (EXCR) is in US\$ as obtained from Yahoo Finance. Data on distance in kilometers and information on common language are obtained from the Centre d'études prospectives et d'informations internationales (CEPII) (2021). EAC, ECOWAS, SADC are the dummy variables for RTAs while OVEACSADC, OVEACCOMESA and OVSADCCOMESA are the dummy variables of overlaps between EAC and SADC, EAC and COMESA as well as SADC and COMESA. Dummy variables take the value of 1 if applicable and zero otherwise.

## 4.7 Estimation techniques

### *(i) Stationarity Tests*

The first step in the analysis is to test for stationarity of each variable. In econometrics, regression analysis requires using series that are stationary as stationarity means the statistical properties of the time series remain stable over time. This is crucial because many statistical tests and analytical models depend on it. Tools for conducting unit root tests in panel data analysis have been developed by several econometricians (see Levin & Lin 2002; Im et al. 1997). The Augmented Dickey-Fuller (ADF) test is widely used to conduct the unit root test. However, ADF is limited by its dependence on the deterministic components of the equation. In addition, it has low power against  $I(0)$  alternatives that are close to being  $I(1)$ . That is, unit root tests are not effective at detecting persistent stationary processes. Furthermore, the power of unit root tests diminishes with each addition of deterministic terms (Dickey and Fuller, 1979).

For the gravity model to be used to successfully assess the link between variables, it is necessary to determine the stationarity of the variables (Faruquee, 2004). Initially, unit-root and cointegration tests of panel data with integrated time series could only be performed where the cross-section dimension and the time series dimensions have equal order, specifically order zero, then when at level zero the variable is not stationary first difference will be used (order 1). However, recently, cross-sectional independence across panel units has been successfully tested by Levin et al. (2002) and Im et al. (1997). The latter method of unit root testing is used in this study. The null hypothesis is rejected when the individual unit root process is statistically significant, and the p-values are less than 5 percent with a conclusion that the variables are stationary. Dummy variables in cross-country estimates, as demonstrated Bayoumi, and Eichengreen (1997), can capture unique elements of both exporting and importing countries trade, allowing the study to test for the heterogeneity between a pair of countries in a bilateral connection. As a result, panel data estimation techniques can recognize and distinguish the special effects of a pair of countries. Once the order of integration of the variables has been established, the second step is to undertake the regressions using Ordinary Least Square or pooled model, the fixed effects and the random effects models.

**(ii) Regression models**

**1. Pooled ordinary least squares**

Pooled ordinary least squares technique (POLS) is mainly used for pseudo panel datasets between-group than within-group variations (Megesa, Chelule& Odhiambo, 2016). This technique aggregates data from all survey waves and makes use of all data variation, including variation between waves and groups. All observations in this model are pooled and the model is estimated by ignoring the cross section and time series nature of the data. One of the major disadvantages with pooled regression is that it does not discriminate between different cross-sectional units and may thus be responsible for masking the individuality that exists within each cross-sectional unit. In other words, by pooling the 34 countries, heterogeneity or individuality that might exist among the 34 exporting countries is ignored. All 34 countries are assumed to have the same amounts. The general pooled model is given by the following expression:

$$y_t = \alpha_0 + \alpha_1 X_t + \varepsilon_t \dots \dots \dots (6)$$

Where  $y_t$  is the dependent variable at time t;  $X_t$  is the independent variable at time t;  $\alpha_0$  is the intercept;  $\alpha_1$  is the regression coefficient and  $\varepsilon_t$  is the error term.

A *pooled model* is suitable if homoscedasticity is detected without autocorrelation and in this case the OLS can be used as the estimator. In a pooled model, like in a simple regression model, the main assumptions are that there are no multicollinearity, heteroscedasticity and time-series correlation (Greene, 2012).

The pooled model for this study is expressed as follow:

$$\begin{aligned} LNEXP_{ijt} = & \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln EXCR_{it} + \beta_4 \ln dist_{ijt} + \beta_5 \ln comlang_{ijt} + \\ & \beta_6 COMESA_{ijt} + \beta_7 EAC_{ijt} + \beta_8 ECOWAS_{ijt} + \beta_9 SADC_{ijt} + \beta_{10} OVEACSADC_{ijt} + \\ & \beta_{11} OVEACCOMESA_{ijt} + \beta_{12} OVSADCCOMESA_{ijt} + \beta_{13} \ln CHNGDP_t * RTA + \\ & \varepsilon_{it} \dots \dots \dots (7) \end{aligned}$$

## 2. Fixed Effects Model

By allowing each of the 34 exporting countries to have their own intercept values, the fixed effect model allows for heterogeneity or individuality and are mainly used to estimate static pseudo models according to Tsai et al., (2014). Because it measures the deviation from the mean within each group over time, FE is a within estimator. However, the group effect varies periodically unlike unobserved individual effect. This makes it difficult to control for the group effect in pseudo panel analysis (Tsai et al., 2014). The drawback disadvantage is that FE focuses mainly on the relationship between the results and the estimators of individual entities and not group or panel entities.

The basic form of the FE model is expressed thus:

$$y_{it} - \bar{y}_i = \alpha_0 + \alpha_1(X_{it} - \bar{X}_i) + (\varepsilon_{it} - \bar{\varepsilon}_i) \dots \dots \dots (8)$$

where  $i$  represents the individual panel units,  $t$  represents the period, and  $\varepsilon_{it}$  is the independent error term. The dependent variable  $\bar{y}_i$  represents the yearly average. The dependent and independent variables are respectively transformed into  $y_{it}$  and  $x_{it}$ , the mean values within each group.

The FE model aids in the analysis of the effect of time-invariant variables. FE investigates the relationship between independent and predicted variables within each entity. By assigning each entity to have its own intercept value, FE model provides for the heterogeneity that exists among each group (in this case, each country).

In FE models, factors are assumed to have distinctive features which are also dissimilar to the model's predictors and error terms. One of the advantages of FE models is that they accommodate time-static variables. In the FE models elements that are individual-specific are not treated as parameters and, hence, are not estimated (Ejemeyovwi et al., 2019).

The fixed effect model for this study is expressed as follows:

$$\begin{aligned} LNEXP_{ijt} = & \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln EXCR_{ijt} + \beta_4 \ln dist_{ijt} + \beta_5 \ln comlang_{ijt} + \\ & \beta_6 COMESA_t + \beta_7 EAC_t + \beta_8 ECOWAS_t + \beta_9 SADC_t + \beta_{10} OVEACSADC_t + \\ & \beta_{11} OVEACCOMESA_t + \beta_{12} OVSADCCOMESA_t + \beta_{13} \ln CHNGDP_t * RTA + (\varepsilon_{it} - \\ & \bar{\varepsilon}_i) \dots \dots \dots (9) \end{aligned}$$

### 3. *Random Effects (RE) Model*

The differentiating factors across entities in a random effects model are assumed to be distinct to the model's forecasters and error term. In the random effects (RE) model, individual-specific elements are not estimated or treated as parameters. Instead, they are considered to have unpredicted and variable means and variances (Ejemeyovwi et al., 2019). The regressors and the unobserved group effect are assumed to be exogenous in this model. It is calculated using generalized least squares (GLS) or maximum likelihood (ML) and accounts for both between-group and within-group variation. RE uses a multi-level structure to partition the unexplained residual variance into higher and lower levels, considering the data's hierarchical structure. The general random effects model is given by the following equation:

$$y_{it} = \alpha_0 + \alpha_1 X_{it} + \mu_i + \varepsilon_{it} \dots \dots \dots (10)$$

The best estimation method for this model is determined by the properties of the two error components. It is commonly assumed that the idiosyncratic error  $\varepsilon_{it}$  it is well-behaved and independent of both the regressors  $X_{it}$  and the individual error term or unobserved individual effect component  $\mu_i$ . The individual components can be either independent or correlated with the regressors  $X_{it}$ .

The specific random effect model for this study is given by the following expression:

$$\begin{aligned} LNEXP_{ijt} = & \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln EXCR_{ijt} + \beta_4 \ln dist_{ijt} + \beta_5 \ln comlang_{ijt} + \beta_6 COMESA_t + \\ & \beta_7 EAC_t + \beta_8 ECOWAS_t + \beta_9 SADC_t + \beta_{10} OVEACSADC_t + \beta_{11} OVEACCOMESA_t + \beta_{12} OVSADCCOMESA_t + \\ & \beta_{13} \ln CHNGDP_t * RTA + \mu_{it} + \varepsilon_{it} \dots \dots \dots (11) \end{aligned}$$

#### **Isolating the overlapping RTAs in the model**

To test and confirm the effect of the overlapping RTAs, all the other variables of RTAs and dummies of the non-overlapping RTAs are removed from the model. The following three equations will then test for the overlap between EAC and SADC, EAC and COMESA and SADC and COMESA:



**(a) Overlap between EAC and COMESA**

$$LNEXP_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln EXCR_{ijt} + \beta_4 \ln dist_{ijt} + \beta_5 \ln comlang_{ijt} + \beta_6 OVEACSADC_t + \beta_7 \ln CHNGDP_t * RTA + (\varepsilon_{it} - \bar{\varepsilon}_i) \dots \dots \dots (12)$$

**(b) Overlap between EAC and SADC**

$$LNEXP_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln EXCR_{ijt} + \beta_4 \ln dist_{ijt} + \beta_5 \ln comlang_{ijt} + \beta_6 OVEACCOMESA_t + \beta_7 \ln CHNGDP_t * RTA + (\varepsilon_{it} - \bar{\varepsilon}_i) \dots \dots \dots (13)$$

**(c) Overlap between SADC and COMESA**

$$LNEXP_{ijt} = \beta_0 + \beta_1 \ln GDP_{it} + \beta_2 \ln GDP_{jt} + \beta_3 \ln EXCR_{ijt} + \beta_4 \ln dist_{ijt} + \beta_5 \ln comlang_{ijt} + \beta_6 OVSADCCOMESA_t + \beta_7 \ln CHNGDP_t * RTA + (\varepsilon_{it} - \bar{\varepsilon}_i) \dots \dots \dots (14)$$

**(iii) Model determination**

**1. Pooled OLS and Fixed Effect**

In this case the choice of the appropriate model is determined using the redundant fixed effects tests. The null hypothesis of the test is that pooling is the best model, and the alternative hypothesis is that fixed effects is the best model. When the p-value is less than 5 percent level of significance, the Null hypothesis is rejected, and the conclusion is that the fixed effects is the best model.

**2. Hausman Test**

The Hausman test is used as a precursor test to determine which model, the random-effects, or the fixed-effects model is the most appropriate model for the panel analysis (Selvi & Mani, 2015). The lower level includes observations that are differentiated at higher levels of the panel groupings. The RE estimates will be skewed if the exogeneity condition is violated (Selvi & Mani, 2015). The Hausman test is a common criterion for choosing between the RE and FE as it compares the efficiency of FE and RE. in FE models, the null hypothesis (H<sub>0</sub>) is that the random effects model is the appropriate model, and the alternative hypothesis (H<sub>1</sub>), is that the fixed effects model is the appropriate model. If the null hypothesis is rejected (p-value < 0.05), then the conclusion is that the fixed effects model is the appropriate one.

### ***3. The test for cross-sectional independence***

The cross-sectional independence across panel units tested using Levin et al. (2002) and Im et al. (1997) and the null hypotheses is rejected if unit roots are statistically significant with p-values of less than 5 percent indicating stationarity of the independent variables. By allowing each of the 42 exporting countries to have their own intercept values, the fixed effect model allows for heterogeneity or individuality.

### **4.8 Chapter conclusion**

This chapter provided an explanation of the methodology to be adopted in the empirical estimation. The model, data sources and estimation technique were explained in detail. This study adopts the augmented gravity model to examine export flows between member nations of RTAs in Sub-Saharan Africa. The dependent variable is each country's exports. The GDP of the exporting countries, the GDP of the importing countries, GDP of China, distance between two countries and language are included as the explanatory variables. In addition, dummy variables that capture membership to the RTAs (COMESA, EAC, ECOWAS, and SADC) and the overlapping memberships are included in the model.

The starting point of the analysis is to determine the order of integration by carrying out unit root tests. To this end, panel unit root tests are undertaken. The findings at this stage informs the decision to undertake cointegration analysis. The cross-sectional independence across panel units is tested using Levin et al. (2002) and Im et al. (1997) and the null hypotheses rejected if unit roots are statistically significant with p-values of less than 5 percent indicating stationarity of the independent variable. By allowing each of the 34 exporting countries to have their own intercept values, the fixed effect model allows for heterogeneity or individuality. Hence, the fixed effects model will indicate if there is heterogeneity among the countries. On the other hand, the random effect variable assumes that there is no difference between the countries. The Hausman test is used as a precursor test to determine which model, the random-effects, or the fixed-effects model is the most appropriate model for the panel analysis. The dummy variables in cross country estimates are expected to capture unique elements of both exporting and importing countries trade, allowing the study to test for the heterogeneity between a pair of countries in a bilateral relation. countries. The

econometric techniques recommend to test for the best models, between OLS and fixed effects model, and between fixed effects and the random.

# CHAPTER 5: ESTIMATIONS AND RESULT ANALYSIS

## 5.1 Introduction

The objective of this study is to examine the impact of Regional Trade Agreements (RTAs), namely COMESA, EAC, ECOWAS and SADC, on export flows of the 42SSA countries. The dependent variable is the exports of the 42SSA countries, and the explanatory variables are the GDP of exporting countries, the GDP of importing countries, and distance between countries, exchange rate, common language, and RTA membership. China's GDP is included interacted with each RTA because it is the main destination of African goods, most of which are natural resources. No single country in the world currently imports natural resources from Africa than China (Stein and Uddhammar 2021). A growing Chinese economy implies more imports from African countries and, hence, increased GDP for these countries, *ceteris paribus*. The higher the GDP of SSA countries the more they import from and export to each other.

## 5.2 Estimation and discussion of results

### 5.2.1 Stationarity Test

Table 5.1 below presents the results of the panel unit root test. The null hypothesis is that there is a unit root and the alternative hypothesis is that there is no unit root. If the p-value is less than 5 percent, the null hypothesis is rejected and the conclusion is reached that the series are stationary. The findings indicate that all the variables have common unit roots because the individual unit root processes are statistically significant, and the p-values are less than 5 percent. Therefore, the null hypothesis is rejected for all the series and the conclusion is that the variables are stationary.

### 5.2.2. Test of Cross-Sectional Dependence (CSD)

The cross-section dependence test is required to determine the dependence error in the residuals. Table 5.2 shows the results of the Pesaran cross-sectional dependence test in the three models. The

null hypothesis of no CSD is rejected as all the probabilities are less than 5 percent (see table 5.2). The results indicate that all the models (pooled, fixed effects, and random effects models) have cross-section dependence in their residuals. The confirmation of CSD in the models requires that CSD should be accounted for or corrected. Therefore, the Estimated Generalized Least Square (EGLS) (cross-section SUR) technique is used for the pooled and fixed effect models, and the White Cross-Section Standard Errors and Covariance is used for the random effect model.

**Table 5.1: Panel unit root test results**

Variables	Unit root test method	Statistic	Prob. **	Conclusion
<i>lnEXP<sub>ij</sub></i>	<i>Levin, Lin &amp; Chu t*</i>	-3.4307	0.0000	I(0)
	<i>Im, Pesaran &amp; Shin W-stat</i>	-4.1043	0.0000	
<i>lnGDP<sub>i</sub></i>	<i>Levin, Lin &amp; Chu t*</i>	-2.3452	0.0000	I(0)
	<i>Im, Pesaran &amp; Shin W-stat</i>	-3.1954	0.0005	
<i>lnGDP<sub>j</sub></i>	<i>Levin, Lin &amp; Chu t*</i>	-2.5439	0.0003	I(0)
	<i>Im, Pesaran &amp; Shin W-stat</i>	-3.1321	0.0006	
<i>lnCHNGDP<sub>t</sub></i>	<i>Levin, Lin &amp; Chu t*</i>	-3.6782	0.0000	I(0)
	<i>Im, Pesaran &amp; Shin W-stat</i>	-3.6543	0.0000	
<i>lnEXC<sub>it</sub></i>	<i>Levin, Lin &amp; Chu t*</i>	-2.6289	0.0000	I(0)
	<i>Im, Pesaran &amp; Shin W-stat</i>	-2.9563	0.0004	
<i>Lndist<sub>ij</sub></i>	<i>Levin, Lin &amp; Chu t*</i>	-17.0321	0.0000	I(0)
	<i>Im, Pesaran &amp; Shin W-stat</i>	-19.4673	0.0000	

Note: \*\*Probabilities for the Fisher tests are computed using an asymptotic Chi-square at 5 percent confidence level.

**Table 5.2: Result for the test for cross-section dependence**

Model	Pooled model		Fixed Effects Model		Random Effect Model	
	t-stat	p-value	t-stat	p-value	t-stat	p-value
Pesaran CD	8.443	0.000	6.187	0.000	7.098	0.000
Pesaran Scaled LM	5.309	0.000	6.981	0.000	7.624	0.000

### 5.2.3 Pooled versus fixed effects models

The redundant fixed effects test is used and the result is presented in the table 5.3 showing that the p-value is  $0.000 < 0.05$ . Hence, the null hypothesis is rejected and it is concluded that the fixed

effects model is the appropriate model to conduct the test. The results in the table 5.3 which were obtained after running the fixed effects test show that the p-value is  $0.000 < 0.05$  necessitating that the null hypothesis should be rejected and confirming that the fixed effects model is the appropriate model.

**Table 5.3: Redundant fixed effects Test**

Effects test	Statistic	Prob
Cross-section F	879.381	0.000

#### 5.2.4 Fixed effects versus random effects models

The Hausman test is the appropriate test to compare the fixed effect model and the random effect model. The null hypothesis is that the random effect is the best model against the alternative hypothesis that the fixed effects model is the best model. In this case, table 5.4 shows the result of the Hausman test indicating that the p-value is  $0.0102 < 0.05$ . Therefore, the null hypothesis is rejected, and it is concluded that the fixed effects model is the best model.

**Table 5.4: Hausman Test**

Test summary	Chi-square statistic	Prob
Cross-section random	22.405	0.0102

As indicated in the result of the fixed effects test and Hausman test above, the fixed effects model is the appropriate model.

#### 5.2.5 Estimation of the models and discussion of results

The confirmation of stationarity of all the variables implies that cointegration test is not required and therefore, the gravity model can be used to estimate the model's parameters. The results in tables 5.3 and 5.4 confirm that the fixed effects are the appropriate model.

To begin the estimations, the pooled gravity model is estimated as a baseline model. The pooled gravity model, which the baseline model, assumes constant coefficients, meaning the exports variable for all the countries under consideration respond similarly to shocks (Hiestand, 2011). However, pooled models do not provide country-specific information, therefore, a model that

allows for variability between countries is essential. Hence, fixed-effects estimator and the random-effects estimations are performed. Table 5.5 shows the results for the pooled model, fixed effects model and the random effects model after correcting for cross-sectional dependence. From the results of the pooled model, fixed effects model, and the random effects model all the coefficients are significant.

**Table 5.5: Estimation results: Impact of RTAs on Export flows.**

<i>Variables</i>	<i>Pooled model</i>	<i>Fixed effects model</i>	<i>Random effects model</i>
	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>
<i>LNGDP<sub>i</sub></i>	<b>0.764***</b> (7.243)	<b>0.435***</b> (6.392)	<b>0.472***</b> (10.125)
<i>LNGDP<sub>j</sub></i>	<b>0.654***</b> (4.875)	<b>0.612***</b> (6.902)	<b>0.640***</b> (5.261)
<i>LnEXCR<sub>ij</sub></i>	<b>0.672***</b> (5.564)	<b>0.657***</b> (7.210)	<b>0.539***</b> (5.342)
<i>Lndist<sub>ij</sub></i>	<b>-0.201***</b> <b>(-4.657)</b>	<b>-0.231***</b> <b>(-2.342)</b>	<b>-0.194**</b> <b>(-1.998)</b>
<i>comlang_off<sub>ij</sub></i>	<b>0.133***</b> (17.002)	<b>0.162***</b> (4.883)	<b>0.123***</b> (4.675)
<i>EAC</i>	<b>0.187***</b> (3.325)	<b>0.170**</b> (2.897)	<b>0.182*</b> (1.965)
<i>COMESA</i>	<b>0.139**</b> (2.005)	<b>0.118**</b> (1.996)	<b>0.156**</b> (1.984)
<i>ECOWAS</i>	<b>0.163***</b> (9.812)	<b>0.151***</b> (3.509)	<b>0.188***</b> (3.964)
<i>SADC</i>	<b>0.247***</b> (7.690)	<b>0.256***</b> (5.432)	<b>0.248***</b> (4.760)
<i>Intercept</i>	<b>1.053***</b> (5.856)	<b>1.543***</b> (5.867)	<b>1.006***</b> (5.342)
R-Squared	0.593	0.602	0.618
<i>F-statistic</i>	12.564	13.543	12.654
P-value	0.000	0.000	0.000
Observation	1968	1968	1968

NB: \*, \*\* and \*\*\* represent respectively the significance levels at the 10, 5 and 1 percent levels of significance, in parentheses are the t-statistics.

Across the three models (Pooled, FE, and RE models), the importing and exporting country GDPs influence exports in the SSA countries positively as indicated by the positive and statistically significant coefficients. The influence of China's GDP on the exports of SSA countries is captured through an interactive term and the results are reported in Table 5.1. It is shown that China's GDP is positive and significant as seen across the estimates of the three models. The results from the pooled, fixed and random effects models show that the coefficient of China's GDP is positive and statistically significant. This implies that as China's economy grows, the exports from SSA countries to China also increase. Increased exports to China then lead to higher income in the SSA countries and, hence, the SSA countries are able to increase production and trade (exports). Therefore, the increase of Chinese GDP positively impacts intra-SSA exports.

The result for the impact of distance on trade is as expected with the coefficient of the distance variable negative and statistically significant in all of the three models. This implies that the distance has a negative impact on intra-SSA trade. This is because distance increases cost of transport, the larger the distance between two countries and, hence, the lower the exports flows between them. The results for common language presented in table 5.5, shows positive coefficients as expected. The results show the common language coefficients in the pooled, fixed effects and random effects models are positive and statistically significant implying that countries with common language trade more, as the common language removes the difficulties of communication.

To examine the impact of membership to a RTAs on export flows, the COMESA, EAC, ECOWAS and SADC RTA dummy variables are included in the model. The result from table 5.5 shows that membership to the EAC enhances export flows of countries in the RTAs as indicated by the positive and statistically significant coefficients across the three models. Similarly, membership to COMESA increases the export flows in the RTA in the pooled, fixed and random effect models as evidenced by the positive and statistically significant (at 5 percent) coefficients in all three models. ECOWAS has positive and statistically significant coefficients in the three models, implying a positive effect on RTA's exports for the countries within the bloc. The coefficient of SADC is positive and statistically significant across the three models implying that membership to the SADC enhances export flows between the member nations.



## 5.2.6 The Effect of Overlapping Membership of RTAs on Export Flows

Previous chapters explained the issue of overlapping memberships in RTAs. It is therefore necessary that overlapping memberships are accounted for in the estimations. Three overlapping cases, between SADC and EAC, between SADC and COMESA and between EAC and COMESA are observed and investigated. Tanzania is the only country that belongs to both EAC and SADC. Therefore, a dummy variable is included to control for Tanzania's dual membership in the Southern African Development Community (SADC) and the East African Community (EAC). Two other dummies are introduced to control for dual membership of Malawi, Madagascar, Zambia, Zimbabwe, Seychelles and Comoros in both SADC and COMESA, as well as dual memberships of Burundi, Kenya, Uganda and Rwanda the EAC and COMESA. Table 5.6 shows the results of the pooled model, fixed effects model and random effects model, where the overlapping membership is controlled for.

**Table 5.6: Empirical Estimates: controlling for overlapping membership.**

Variable	Pooled model	Fixed effects model	Random effects model
	Model 1	Model 2	Model 3
<i>Intercept</i>	<b>2.485***</b> (3.904)	<b>1.711**</b> (2.139)	<b>1.692***</b> (2.159)
<i>LNGDP<sub>i</sub></i>	<b>0.434***</b> (4.293)	<b>0.346***</b> (3.084)	<b>0.445***</b> (3.458)
<i>LNGDP<sub>j</sub></i>	<b>0.415***</b> (3.032)	0.388*** (5.219)	<b>0.469***</b> (6.161)
<i>LNDIST<sub>ij</sub></i>	<b>-0.389**</b> (-2.941)	<b>-0.042***</b> (-3.348)	<b>-0.410***</b> (-4.563)
<i>LNEXCR<sub>ij</sub></i>	<b>0.228**</b> (2.067)	<b>0.397***</b> (9.094)	<b>0.359***</b> (6.699)
<i>COMLANG_OFF</i>	<b>0.218**</b> (2.067)	<b>0.300***</b> (4.008)	<b>0.298***</b> (4.587)
<i>EAC</i>	<b>0.128**</b> (2.401)	<b>0.146**</b> (2.697)	<b>0.141***</b> (7.521)
<i>ECOWAS</i>	<b>0.130**</b> (2.818)	<b>0.112**</b> (2.585)	<b>0.162***</b> (4.139)
<i>COMESA</i>	<b>0.123**</b> (2.079)	<b>0.173**</b> (2.604)	<b>0.171**</b> (2.572)
<i>SADC</i>	<b>0.171**</b> (1.990)	<b>0.193***</b> (6.507)	<b>0.138***</b> (6.483)
<i>OVEACCOMESA</i>	<b>0.290***</b> (3.439)	<b>0.228***</b> (5.633)	<b>0.268**</b> (2.915)
<i>OVEACSADC</i>	<b>0.286**</b> (2.474)	<b>0.259**</b> (2.601)	<b>0.337***</b> (3.392)

<i>OVSADCCOMESA</i>	<b>0.108***</b> (2.957)	<b>0.149**</b> (2.145)	<b>0.158***</b> (4.771)
<i>RTA*LNCHNGDPT</i>	<b>0.336***</b> (5.732)	<b>0.313**</b> (3.084)	<b>0.392***</b> (3.296)
<i>R-Squared</i>	0.529	0.659	0.615
<i>F-statistic</i>	4.208	29.939	2.055
<i>P-value</i>	0.000	0.000	0.012
<i>Observation</i>	1968	1968	1968

NB: \*, \*\* and \*\*\* represent respectively the significance levels at the 10, 5 and 1 percent levels of significance, in parentheses are the t-statistics.

When overlapping membership is accounted for, the result across the three models is that of positive and statistically significant coefficients. The results show that the country in the overlap, in the case of overlap between EAC and SADC (OVEACSADC), exports increase by 29 percent, 26 percent and 34 percent respectively for the pooled, fixed, and random models. In the overlap between EAC and COMESA (OVEACCOMESA), the result shows that the countries whose membership overlap these two RTA's experience enhanced exports as a result. Specifically, the overlap in membership enhances export performance by 29 percent, 23 percent and 12 percent in the pooled, fixed and random effects models, with the random effects model showing the smallest magnitude of increased exports. Finally, the result for the overlap between SADC and COMESA shows the smallest magnitude in enhanced exports experienced. In this case, the pooled, fixed and random effect models suggest that exports increase by 11 percent, 15 percent and 16 percent, indicating that membership overlap between the SADC and COMESA has the smallest contribution to exports between the member states in the overlap. This may be because large distances separate member states. For instance, Tunisia, Libya and Egypt in the north of Africa and Zimbabwe, Malawi in the south of Africa.

overall, the impact of membership to more than one RTAs pointing to the fact that there exist high levels of interdependence between the involved countries. They rely on each other's markets for the exchange of goods and services, suggesting that they have complementary economies and are likely to benefit from each other's production and consumption capabilities. It may signal the presence of regional trade agreements or economic blocs that promote the flow of goods and services among member countries, leading to increased trade volumes.

The coefficients of the overlapping variables are positive and statistically significant indicating a positive relationship with trade. The magnitudes of the parameters are **0.147, 0.116, and 0.132** respectively for overlapping between SADC and COMESA, EAC and SADC, and EAC and COMESA and these coefficients show the strength of the relationship. The positive wind falls from being member of overlapping RTAs indicates that the countries in the overlap webs create multiple avenues for exporting goods and services. This diversification of export markets reduces a country's dependence on a single market, making it less vulnerable to economic downturns or disruptions in a particular region. If one market experiences a slowdown, a country can compensate by increasing exports to other overlapping markets. In addition, all countries that are overlapping provide opportunities for networking and synergies. Businesses that can establish relationships and partnerships to facilitate trade. They can share knowledge, technologies, and best practices with other countries that have similar markets or trade interests. Such collaborations can enhance the competitiveness of exports and foster innovation. This finding is contrary to Fanta (2021) who finds that being a member of multiple RTAS reduces trade in the eastern and southern Africa. However, the finding is in line with that of Ngepha and Udeagha (2019) who find that multiple membership of RTAs enhances trade in Africa. In this case it seems that the effect of trade creation overcomes that of trade diversion.

From table 5.6, the coefficient of the GDP of the importing country has the expected positive sign and is statistically significant across the three models. Specifically, a one percent increase in the importing countries GDP increases exports by 42 percent, 39 percent, and 47 percent. This result implies that export flows increase with the size of the GDP of the trading partners. The overall finding of a positive impact of importing country GDP on exporting country GDP is consistent with earlier research (see Orindi 2011; Mankiw 2018; Wölwer, Breblein & Burgard, 2018). Karamuriro and Karuk (2015) explain that the importer's GDP has a significant impact on the amount of trade between trading partners, as is the case of Uganda and Kenya which share a border and both countries membership to the EAC are factors that boost GDP in both countries.

The exporting country GDP has a positive effect on exports flows between the SSA countries. This is shown by the positive and statistically significant coefficient of the variable. Specifically, when the GDP of the exporting country increases by one percent, the exports flows increase by 43 percent, 35 percent, and 45 percent for the pooled, fixed effects and random effects models respectively. This finding aligns with the theory of international trade which posits that exports of

a country are positively related to the income (GDP) of the importing country or the trade partner and the relative price between the two countries see (Mankiw 2018).

The results of the exchange rate in the three models show a significant and positive impact of exchange rate on export performance in the SSA RTA countries. The result suggests that a stronger exchange rate makes SSA exports relatively more expensive for foreign buyers, potentially reducing the competitiveness of their goods and services in international markets. This may lead to a decline in export volumes and revenue for SSA countries, especially if they rely heavily on price-sensitive exports. Conversely, the strong exchange rate can also lead to lower import prices for SSA countries, which can be beneficial for their import-dependent industries and consumers. Cheaper imports can result in cost savings for businesses and potentially lead to lower inflation, which benefits consumers. Additionally, this strong exchange rate can affect a country's trade balance. If the impact on export revenues is greater than the savings from cheaper imports, it may lead to a deterioration in the trade balance (Tarasenko, 2021).

According to convention, the coefficient of geographical distance is negative. In all three models, the coefficient of distance has the expected negative sign and are statistically significant. The finding on distance is congruent with those of Nkoroi (2015), who finds that closeness and shared borders encourage informal economic linkages between Kenya and Uganda. Distance is negatively linked to the cost of transport, and thus the further apart trading partners are, the lower the export flows between them.

From the result, the coefficients of common language across the three models are positive and statistically significant as expected. A positive and statistically significant coefficient indicates that common language has a positive impact on the trade between two countries. This is because when two trading partners speak the same language, it is easier to communicate and negotiate effectively. This conclusion is reinforced by the findings of Karamuriro (2015), Eita & Jordaan (2007), who observe that countries with common language, culture, and colonial ties had significant commerce amongst themselves in their respective research.

With respect to the importance of membership to a RTAs for export flows, the results in table 5.6 show that across the 3 models, membership to the RTAs has a positive and statistically significant impact on export flows in the RTA's. The implication is that membership of the RTAs enhances

export flows between the member nations. The results also highlight that, although SADC membership enhances exports within the bloc, the magnitude is more than the impact of ECOWAS but less than that of EAC on their respective exports. This finding is attributable to the fact that South Africa, the most dominant economy in the region trades significantly more with both SADC and non-SADC countries such as China, India, the USA, and Germany, unlike the other smaller economies in the SADC region. For example, between 2017 and 2019, South Africa accounted for 66 percent of intra-SADC exports (Tralac 2020).

In terms of the significance of membership to each RTA on the exports of the bloc, it is observed from table 5.6 countries belonging to the EAC accounts for an increase in the RTAs exports of between 13 and 15 percent. This implies that membership of EAC significantly enhances the exports of member countries within that RTAs. Similar findings are provided by UNCTAD (2009) which notes that, since the formation of the EAC, exports from Uganda to other EAC members increased by 40 percent. The SADC RTA has enhanced exports within member countries between 14 percent and 19 percent, while ECOWAS enhances exports by between 11 percent and 16 percent, and finally COMESA enhances exports by between 12 percent and 17 percent.

### **5.3 The impact of Chinese-Africa Trade on RTA exports.**

As previously discussed, China is a main trading partner of most, if not all, of the SSA countries in the RTAs under consideration. Of course, the increased exports to China is due to its large and growing economy. Hence, these SSA countries use the increased income from export earnings from China to import more including from the neighboring RTAs member countries. This is a significant contribution of this study to the body of knowledge as there is no previous study that has considered the impact of a country outside the bloc when examining the impact of RTAs on trade flows. The findings reveal that Chinese GDP interacted with RTAs countries has a positive and statistically significant impact on the 42 SSA countries export flows. The three models indicate the magnitude of 34 percent, 31 percent and 39 percent for pooled, fixed effects and random effects models respectively. The result of a positive impact of China's economy in the countries in the regional trade agreements suggests that as China's GDP increases, the export performance of the countries in the RTAs is expected to increase. In other words, a higher GDP in China is associated with greater trade benefits. A stronger Chinese economy might provide larger markets and greater

demand for goods and services from other countries in the trade agreements, leading to increased exports and economic growth for these countries.

The impact of China-Africa trade on economic activities in SSA, particularly in the last 15 years, has also been highlighted in the findings of earlier studies. For example, Busse, Erdogan, & Mühlen (2014) notes that China became SSAs largest bilateral trade partner in 2012 when total merchandise trade between China and Africa increased to US\$166 billion from US\$9 billion in 2000. In addition, Chinese FDI flows to SSA increased from a low of US\$200 million in 2000 to US\$2.9 billion in 2011, making China the biggest developing country investor in Africa (UNCTAD, 2013). Furthermore, China has been providing SSA with official development aid (ODA) in the form of economic and technical cooperation. In 2011, China's overall ODA increased to \$29 billion, up from \$1.2 billion in 2000. ODA and FDI are examples of investment flows that can stimulate, not only exports but also, economic development in SSA. All these activities of China in SSA are made possible because of its large GDP.

#### 5.4 The impact of RTA membership on individual country exports

The country-specific effects estimations show the effects which are unique to each country and are provided in table 5.7 below. These coefficients of specific effects underline the impact of the bilateral trade between SSA and its trading partners that are dissimilar from country to country.

**Table 5.7: The impact of RTA membership on individual country exports**

<i>COMESA</i>		<i>ECOWAS</i>		<i>SADC</i>		<i>EAC</i>	
<i>count</i>	<i>Coefficient</i>	<i>Count</i>	<i>Coefficient</i>	<i>Count</i>	<i>Coefficient</i>	<i>Count</i>	<i>coefficient</i>
<i>C</i>	<i>6.90E-17***</i>	<i>C</i>	<i>0.110***</i>	<i>C</i>	<i>0.053***</i>	<i>C</i>	<i>0.011</i>
	<i>(0.368)</i>		<i>(7.325)</i>		<i>(4.056)</i>		<i>(0.909)</i>
<i>COM</i>	<i>0.133***</i>	<i>BFA</i>	<i>0.794***</i>	<i>BWA</i>	<i>0.863***</i>	<i>KEN</i>	<i>0.667***</i>
	<i>(7.022)</i>		<i>(8.792)</i>		<i>(10.410)</i>		<i>(9.113)</i>
<i>BDI</i>	<i>0.104**</i>	<i>BEN</i>	<i>0.753***</i>	<i>AGO</i>	<i>0.826***</i>	<i>BDI</i>	<i>0.650***</i>
	<i>(2.360)</i>		<i>(8.361)</i>		<i>(10.224)</i>		<i>(8.050)</i>
<i>DJI</i>	<i>0.281***</i>	<i>CIV</i>	<i>0.892***</i>	<i>COK</i>	<i>0.921***</i>	<i>RWA</i>	<i>0.571***</i>

	(2.959)		(8.816)		(11.385)		(8.308)
<i>EGY</i>	0.114**	<i>CPV</i>	0.762***	<i>LSO</i>	1.062***	<i>TZA</i>	0.855***
	(2.682)		(7.993)		(13.006)		(10.857)
<i>ERI</i>	0.312***	<i>GHA</i>	0.731***	<i>MDG</i>	0.999***	<i>UGA</i>	0.809***
	(2.958)		(7.590)		(12.033)	-	(9.057)
<i>ETH</i>	0.523***	<i>GIN</i>	0.769***	<i>MOZ</i>	0.782***	-	-
	(4.328)		(7.815)		(10.965)	-	-
<i>KEN</i>	0.104***	<i>GMB</i>	0.962***	<i>MUS</i>	0.763***	-	-
	(3.309)		(9.987)		(10.042)	-	-
<i>LBY</i>	0.133***	<i>GNB</i>	0.808***	<i>NAM</i>	0.892***	-	-
	(7.538)		(8.389)		(10.931)		
<i>MDG</i>	0.581***	<i>MLI</i>	0.762***	<i>SWZ</i>	0.933***		
	(5.359)		(7.993)		(11.442)		
<i>MWI</i>	0.114***	<i>NER</i>	0.846***	<i>SYC</i>	-0.003		
	(4.183)		(8.789)		(-1.467)		
<i>MUS</i>	0.548*	<i>NGA</i>	0.880***	<i>TZA</i>	0.797***		
	(1.915)		(9.301)		(10.349)		
<i>RWA</i>	0.617***	<i>SEN</i>	0.769***	<i>ZAF</i>	0.736***		
	(3.626)		(7.989)		(9.900)		
<i>SDN</i>	0.144***	<i>SLE</i>	(9.588)	<i>ZMB</i>	0.791***		
	(1.945)				(10.651)		
<i>SYC</i>	0.791***	<i>TGO</i>	0.867***	<i>ZWE</i>	0.723***		
	(2.971)		(9.290)		(10.138)		
<i>UGA</i>	0.522**						
	(4.341)						
<i>ZMB</i>	0.114*						
	(1.710)						
<i>ZWE</i>	0.492**						
	(2.911)						

Notes: “\*”, “\*\*”, and “\*\*\*” represent the significance level at 10 percent, 5 percent and 1 percent and the t-statistics in parentheses

## **The Effect of Overlapping Membership of RTAs on Export Flows**

From table 5.7, the results of the effect of RTAs membership on the individual country exports demonstrate that for all the countries in COMESA, ECOWAS, EAC, and SADCRTAs (apart from Seychelles). The membership to the RTAs has a positive and statistically significant impact on exports implying that the considered RTAs group plays a positive role in promoting trade between members. Seychelles is the only country that displays mixed results for COMESA and SADC. Its membership to the SADC does not enhance the region's exports as indicated by the negative and statistically insignificant coefficient of its export variable. However, as a member of COMESA, its contribution to exports is significant at 1 percent level. This may be explained by the fact that Seychelles is a small island economy with limited resources and small GDP (1.4 billion US dollars according to Trading Economics, (2022)) and as such does not import from, or export much to, the other countries in the region. It may also be because the country's international trade is not liberalized enough to enable free flowing of goods between it and the other countries in the SADC region (US Department of State, 2021). These results confirm that COMESA, ECOWAS, and SADC, EAC, member countries are heterogeneous in size and economic performance.

## **5.5 Conclusion**

The estimation results (pooled model, fixed effects model, and random effects model) show that the GDP of importing SSA countries has a positive and significant impact. The higher the GDP of the trading partners (importers), the larger the exports of the other trading partners, according to these positive and statistically significant results. In accordance with convention, the coefficients for geographical distance are negative and statistically significant for the pooled model, fixed effects, and random effects models.

For the fixed-effects model, the results for common language are positive and statistically significant at the one percent level, showing that having a common language boosts bilateral trade between two countries. The East African Community (EAC) results demonstrate that all coefficients in all models are only negative and statistically significant at the 1 percent level in model 2, when it comes to the impact of each RTAs on trade flows in SSA nations. The results reveal that EAC increase exports to SSA by between 21 percent and 24 percent. As a result, exports of EAC member nations as well as other countries in the SSA region grew, implying that the EAC bloc plays an important role in SSA trade.



Furthermore, the results show that the dummies for the overlapping RTAs are positive and significant. This finding implies that having overlapping RTAs, increases exports for the countries in the overlap. There is small but positive impact on bilateral trade bloc, perhaps due to trade creation effects.

The country-specific effects allow for the examination of the specific impact of an RTAs on individual SSA country export flows. For example, some of the countries, such as South Africa, Rwanda and Nigeria have experienced substantial trade creation while others such as Zimbabwe, Angola, Ghana, Kenya, Lesotho, Madagascar and Mali exhibited moderate trade creation.

Membership of more than one RTAs has been shown to increase exports in the RTAs and in the individual countries in the overlap webs. This is more pronounced for the overlap between COMESA and the EAC. Similarly, EAC countries are all members of COMESA and enjoying market access to several regional hegemonies such as Egypt, Kenya and DRC.

China's GDP has high and positive coefficient indicating positive effect on exports of all SSA countries in the three RTAs. The intuition on China's GDP is derived from how Chinese economic involvement in individual countries influences economic output of these countries which in turn impacts on their exports. China is heavily involved in funding building infrastructure projects, and is the largest importer from SSA countries, especially from the resource rich nations. All these factors have the effect of raising the GDPs of the SSA countries, which in turn boost their imports. Since these countries also trade with each other, the overall effect is an increase in exports. This becomes an important contribution of this study in developing a new line of literature on the impact of regional trade, because, to the researcher's knowledge, no study has considered the impact of the Chinese GDP, that is a country outside the bloc under consideration, when conducting the gravity model analysis.

# CHAPTER 6: CONCLUSION

## 6.1 Introduction

The importance of trade for economic growth and development continues to be a topical issue in academia and policy circles and has generated a lot of debate around the role of regional economic integration in enhancing economic growth and development. The literature on regional integration, and specifically RTAs and their effectiveness, is still ambiguous. For example, Mvogo (2021) argue that African integration efforts through RTAs have mostly failed, particularly in terms of increasing regional trade and, more crucially, improving economic advancement. They base their conclusion on the fact that inter-regional trade in SSA is limited because the countries in the region have similar trade patterns. Conversely, other empirical studies indicate that intra-SSA trade is boosted by the reduction of trade barriers (Juma & Mangeni, 2015; UNCTAD 2019).

Many SSA countries are members of customs unions such as SACU, CEMAC and WAEMU and, although 34 Countries are part of active free trade areas such as COMESA and monetary unions, no genuine liberalization of trade is being achieved under these conglomerations. Indeed, the literature reveals that the failure of integration in SSA countries is explained by the incapacity or the lack of will of the member states to proceed with preferential trade reforms. These reforms are a prerequisite for the creation of additional trade flows within the RTAs.

Studies explaining international trade flows and their impacts on RTAs in SSA are sparse. Moreover, previous research has not used proper methodology for explaining international trade flows in SSA in the context of RTAs. To address these gaps, this study adopted the gravity model to investigate the impact of RTAs in Africa on export flows between member countries within the RTAs. Using export data of 42 SSA countries, this study applied panel data-estimation techniques, to explain the impact of RTAs on export flows within the major RTAs in SSA.

## 6.2 Findings

The findings reveal that the importing country's GDP has a positive impact on exports of its bilateral partners, implying that the higher the GDP, the more a country imports and the more its neighbors export to it. Furthermore, the GDP of the exporting country has a beneficial impact on the exports of the neighboring countries. The findings also show that greater distance between trading partners discourages trade, whereas common language encourages export flows.

This study also examined the impact of RTAs on the bloc's export flows. From the results, it is concluded membership of the bloc is an important contributor to regional trade, through increasing exports of member countries within the EAC and COMESA, as well as for other countries in SSA. Membership of ECOWAS also contributes significantly to trade in the bloc. However, although membership to the SADC, enhances intra-regional exports, the contribution is lower than that experienced in both the ECOWAS and the EAC. This suggests that gains from exports are distributed more fairly in the EAC and ECOWAS than in the SADC RTAs. This might be due to the dominance of South Africa within SADC, not only in regional trade, but also in other economic aspects such as manufacturing, transport and warehousing.

The study investigated the impact of overlapping membership of RTAs on exports. Three RTAs (COMESA, SADC, and EAC) have member countries that belong to more than one RTAs. and the countries concerned benefit because of this dual membership. Membership of more than one RTA has been shown to increase exports in the RTAs and in the individual countries in the overlap webs. This is more pronounced for the overlap and between COMESA and the EAC. Similarly, EAC countries are all members of COMESA and enjoying market access to several regional hegemonies such as Egypt, Kenya and DRC. This finding is in line with the finding of one study but differs with the most recent empirical work on this subject indicating that further research needs to be conducted on a wide number of RTAs in, not only Sub-Saharan Africa, but the entire continent as a whole. contrary to what some studies have observed. In this case it seems that the effect of trade creation overcomes that of trade diversion.

The country-specific estimations show that South Africa, Rwanda, Nigeria Zimbabwe, Angola, Ghana, Kenya, Lesotho, Madagascar and Mali are experiencing increased export flows (trade creation) as a result of belonging to their respective RTAs. The impact of the RTAs on the exports

of Burundi, Cote D'Ivoire, and Guinea Bissau is insignificant while Benin, Burkina Faso, Mozambique, Niger, Senegal and Uganda, are experiencing negative growth in exports or trade diversion.

Finally, the study considered the impact of China's GDP on the intra-SSA exports given that China is heavily involved in the region through trade and investment activities. The findings reveal that China's economic growth (GDP) has a positive and considerable impact on all the SSA RTAs countries' exports. This is because as China's GDP increases, it increases its imports from countries in the RTAs. The earnings from exports add to the GDP of these countries and, hence, they increase their own imports from each other due to the realized larger income.

### **6.3 Recommendations**

The findings of this study can inform policymaking on the benefits and general impacts of the RTAs in SSA. Firstly, the results find that exports between SSA countries are still minimal especially for ECOWAS and SADC. Therefore, historical and cultural affinity between SSA countries should be leveraged to boost trade between the countries of the SSA. Also, a diversification of export basket and beneficiation of commodities such as gold, copper, aluminum as well as iron, should be pursued or enhanced to increase trade between the countries in SSA. Secondly, the results indicate significant correlation between Chinese GDP and exports of SSA countries. Hence, trade relations between these countries and China should be enhanced given the rapid growth and magnitude of China's GDP.

### **6.4 Limitations of the Study**

Although a sample of 78 percent of the SSA countries are used in this study, one of the limitations is the lack of data of some countries such as Southern Sudan, the DRC, Central African Republic and Chad. This frustrates the effort to conduct a complete census of all the 42 countries in SSA. Moreover, some of these countries in the EAC such as Southern Sudan, Burundi and Rwanda, and Burkina-Faso in the case of ECOWAS, are late entrants to the RTAs and this frustrates the effort to draw a distinct pre- and post-RTAs period. Therefore, the attempt to analyze trade flows before and after the formation of an RTAs was abandoned as this requires an expanded scope of the study.

## **6.5 Suggestions for Future Research**

In future research, the influence on trade flows before and after the creation of RTAs should be examined. A future study with an expanded mandate could also explore the impact RTAs have on trade flows between each bloc and countries outside of the African continent. In addition, future research could examine the influence of larger economies such as USA and India on trade flows on the African continent as this research finds the influence of China being significant in explaining trade between African countries.

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