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TITLE: THE IMPACT OF TRADE BLOCS ON POVERTY REDUCTION IN AFRICA.

**A Research Report submitted in partial fulfilment of the Degree of
Master of Commerce (Applied Development Economics)
in the School of Economics and Finance,
University of the Witwatersrand.**

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Declaration

I hereby declare that this Research Report is my independent work and certify that, to the best of my knowledge that all work contained herein is my own. I have duly acknowledged all sections where I have used other authors' work.



Virginia N Onuorah

DEDICATION

This Research Report is dedicated to Lord Jesus for His Grace and to my family for their steadfast support and prayers.

Abstract

In recent years, Africa has made many efforts to eradicate poverty, but progress has been unimpressive when compared to other continents. Africa as a continent continues to face a persistent rise in poverty levels despite numerous existing poverty reduction policies. In the quest to stimulate economic growth and development, which will further reduce poverty in the region, numerous trade reforms are implemented through trade openness, including Trade Blocs (TBs). This study offers an empirical assessment of the poverty reduction impact of various African TBs. Also, it assesses the interactive impact of the proximity of countries that trade together on poverty, driven by the need to establish whether there is poverty reductive impact of TBs among countries that trade together and also for countries with closed borders in Africa. A variety of techniques are used in the study, such as Random Effects (RE), Fixed Effects (FE), and Ordinary Least Squares (OLS) to handle endogeneity, it additionally makes use of the Generalised Method of Moments (GMM) estimation methodologies developed by Arellano and Bond in (1991).

The data used for the study is a panel data for 53 African countries from 1995 to 2023. Our results prove that TBs have a significantly reductive effect on poverty reduction in most of the Trade Blocs used in the study except for East African Community and Economic Community of West African States, while Trade Blocs between African countries that share borders impacted positively on poverty reduction. The study concludes that while most TBs in Africa benefit member Nations, Africa's poor and deficient infrastructure tends to militate against the full benefits of regional Trade in Africa; Why our second research question has a positive outcome on poverty reduction. The study recommends and believes that the right Policy reforms, which include investment in infrastructure and improvement in Africa's transportation link, will create a favourable atmosphere for intra-trade within the region, thereby ensuring that the World Bank Sustainable Development Goal for Africa is achieved.

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ACRONYMS

AFTA	African Free Trade Area
AfCFTA	African Continental Free Trade Area
AU	African Union
BRICS	Brazil Russia India & South Africa
CBC	Cross- Border Cooperation
CEPII	Centre d'Études Prospectives et d'Informations Internationales
COMESA	Community Market for Eastern and Southern Africa
CU	Customs Union
EAC	East African States
ECCAS	Economic Community of Central African States
ECOWAS	Economic Communities of West African States
EU	European Union
FE	Fixed Effects
FGT	Forster-Greer- and Thorbecke
FTA	Free Trade Area
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GDPPC	Gross Domestic Product Per Capita
GMM	Generalized Method of Moments
GVA	Gross Value Added
ICBT	Informal Cross-Border Trade
IGAD	Inter-Governmental Authority on Development
LPA	Lagos Action Plan
MDG	Millennium Development Goals
NGT	New Growth Theory
OAU	Organization of African Unity
OLS	Ordinary Least Square
POVGAP	Poverty Gap
POVHC	Poverty Headcount
R&D	Research & Development
RE	Random Effects
REC	Regional Economic Corporation
RIA	Regional Integration Agreements
RTA	Regional Trade Agreement
SACU	South African Custom Union
SADC	South African Development Community
SADCC	South African Development Coordination Conference
SDG 1	Sustainable Development Goal 1 No poverty, of the UN
SGMM	System Generalized Method of Moments
TBs	Trade Blocs
UMA	Arab Maghreb Union
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
WDI	World Development Indicators
WTO	World Trade Organization

CHAPTER ONE: THE INTRODUCTION

This study has two objectives: it firstly asks whether Trade Blocs (TBs) in Africa contribute to Poverty reduction. If so, it then asks if the reduction in Poverty is a result of the closeness to one another or from interacting with one another in trade. This chapter is organised in the following pattern: Section 1.1 provides the background of the study, 1.2 the problem statement, while 1.3, 1.4, and 1.5 present the research questions, the hypothesis, and objectives, respectively. Section 1.6 highlights the justification of the study while Section 1.7 outlines the structure of the research report.

1.1 The Background of the Study.

Poverty is a major development issue and a concern for governments, international organizations, and policymakers worldwide. It was made the first goal of the United Nations Sustainable Development Goals (SDGs), which aim to reduce and eradicate poverty around the world. Poverty encompasses more than just the lack of money and productive resources. It includes additional elements such as limited access to education and basic services, lack of food and nutrition, social prejudice and exclusion, and limited involvement in decision-making processes (UN, 2022). It is sometimes expressed as the proportion of the population that makes less than a given income standard, such as the international poverty line, which varies depending on the categorization of the nation and is set at \$1.90, \$3.20, or \$5.50 per day (World Bank, 2023c). Approximately 40 percent of the Sub-Saharan African population still lives in extreme poverty (World Bank, 2020).

Poverty reduction means reducing the incidence and severity of poverty to enable people to lead a better quality of life. This can be achieved through various means, including economic growth, job creation, improved access to education and healthcare, and targeted social safety net programs. Poverty reduction requires a multifaceted approach that addresses the immediate needs of poor households and the underlying structural and systemic factors contributing to poverty. By working towards more equitable and inclusive economic growth and supporting the development of strong institutions and governance, poverty reduction efforts can help to create a more sustainable and prosperous future for all. The pandemic in 2020 was said to have wiped out the gains made in fighting food instability and malnutrition, causing extreme poverty to rise by more than 3% in the continent (UN, 2022). However, despite the COVID-19 and the climate change reversal impact, there has been tremendous progress in poverty

reduction at a global scale in recent times (World Bank, 2020). It is indicated that the number of people living below the international poverty line worldwide between 2015 and 2018, fell from 741 million to 689 million (World Bank, 2020).

However, contrary to these global improvements, Africa, especially the SSA, still exhibits a slower rate of poverty reduction compared to other world regions (World Bank, 2020). Approximately 32.2 percent of the SSA population still live on less than US\$1.90/day in 2023, and almost 70 percent lived on less than \$3.20/day (the poverty line of lower-middle-income economies) (World Bank, 2023). Hence, The African Union Commission (AUC) Agenda 2063's aspires for "a high standard of living, quality of life and well-being for all citizens and targets to end poverty as a priority. The World Bank and World Trade Organisation recognize trade integration as an avenue to eradicate poverty (WTO, 2019). Following that, Recent studies have assessed the impact of trade integration on poverty reduction (e.g., Ilyas et al., 2023; Ozigbu, 2023; Yameogo & Omojolaibi, 2022; Umeh et al., 2021; Onakoya et al., 2019; Bui et al., 2016). Each study came up with different relationships and significances of trade integration on poverty reduction. However, no scientific investigation was conducted on the poverty reduction impact of the 7 major African Trade blocs on its member nations. Therefore, this study seeks to understand the impact and significance of the 7 Sampled Trade Blocs on poverty reduction.

1.2 Problem Statement

Since their independence, African governments have pursued regional integration to generate wealth and improve welfare on the continent. Among the aims is to address the challenges of underdevelopment, increase economies of scale, and foster trade, investment, and technology diffusion for greater diversification, growth, and poverty reduction. In line with the continental agenda, eight regional economic communities (RECs) were created and recognised by the African Union (AU) to serve as building blocks for broader continental integration, recently marked by the establishment of the African Continental Free Trade Area (AfCFTA). However, after many years of existence, the progress in integration within RECs has been mixed with successes and failures recorded, among the successes are the reduction and removal of trade tariffs and the facilitation of the cross-border movement of persons, although with significant heterogeneities across various blocs. Intra-African trade remains significantly lower than regional trade in other parts of the world, with only about 15% of Africa's total trade occurring between African countries compared to 54% in the North American Free Trade Area (NAFTA), the European

Union (70%), and Asia (60%). This low level of intra-African trade presents a major challenge to Africa's economic development (IMF, 2019). Furthermore, most African countries seem to have been unable to harness the opportunities of regional trade integration (RTI) for employment creation and poverty reduction. Progress on industrialization has been disappointing, and growth has been accompanied by a shift of labour to the low-productivity service sector, leading to a slower fall in poverty levels compared with the rest of the developing world (McMillan and Rodrik, 2011).

In Europe, studies show that Trade agreements positively impact regional trade across Europe as it enhances inter regional trade volume within the region. Kadir Basboga, (2020) further explained how the increased volume of intra trade increased GDP per capita across the region, explaining the benefits accruing to TBs members within the region.

Poverty rates in Africa remain high despite the formation of various Trade Blocs aimed at reducing poverty levels in the region. As of 2023, about 45 % of the EAC's population lived below the \$2.15/day international poverty line, roughly 15 percentage points above the continental average (ISS AFRICA, 2023). SADC has about 45.1 % of the population living in extreme poverty, with Southern Africa also ranking high in multidimensional poverty (UNECA, 2023). According to Ghana Systematic Country diagnostic, in 2023, the poverty rate in West Africa under ECOWAS is estimated at 32.5 %, meaning over 140 million people in West Africa still live in extreme poverty under the same threshold. ECCAS representing central Africa had the highest regional extreme poverty rate in Africa, at around 49 %, showing little progress over the past decade (UNECA, 2023). Covering both Eastern and Southern Africa, COMESA spans regions with a very high poverty rate. In 2023, Eastern Africa had about 33 % poverty rate, while Southern Africa was higher at 45 %, making COMESA a high-poverty bloc. IGAD member states (e.g., Ethiopia, Somalia, Sudan) overlap with high-poverty regions in East Africa. In 2023, poverty across IGAD was like that of EAC, around 45 % of the population lived below the \$2.15/day line. SACU countries (South Africa, Botswana, Namibia, Eswatini, Lesotho) remained burdened by high poverty, averaging around 45 % in extreme poverty. North Africa with AMU, remains the only region in Africa to have nearly eradicated extreme poverty, reaching the SDG benchmark of below 3 % in 2019 and remained consistent through 2023 (ISS AFRICA, 2023). Nega et al. (2021) reiterated that regional integration could be a means, but not an end, to addressing the developmental challenges that African countries face, the most serious of which is achieving sustained growth and poverty reduction on the continent, which this study intends to validate.

1.3 Objectives of The Study

Having noted the persistent Africa's poverty rate despite increased participation in inter and intra trade agreements across the continent. This study envisions to undertake an empirical investigation in order:

- To assess if various Regional Trade Blocs have contributed to Poverty Reduction in Africa
- To examine whether the interaction and contiguity of countries that share borders contribute to reduction of poverty in Africa?

1.4 Specifying the hypothesis

To address the above objectives, our null hypotheses are stated below:

$H_0: \beta=0$ TBs have no substantial influence on the alleviation of poverty in Africa.

$H_1: \beta \neq 0$ TBs significantly reduces poverty in Africa.

$H_0: \beta=0$ The contiguity of TBs does not have a major effect on poverty alleviation.

$H_1: \beta \neq 0$ The contiguity of TBs has a major effect on poverty alleviation.

1.5 Justification of the study

The positive effect of intra trade in Africa is supported by many studies, but still, not enough research has been undertaken concerning the specific impact of Trade Blocs on Poverty. Many of these studies focus more on the possibilities of regional trade in Africa than on the impact on poverty reduction. For instance, Carrere (2004) assessed how SADC, COMESA, and ECOWAS affect the trade potential of their member nations. Musila (2005) evaluated the level of commerce between ECOWAS. Foroutan and Pritchett (1993) examined intra sub-Saharan African commerce in terms of its magnitude concerning expected gravity levels, whereas Lewis, Robinson, and Thierfelder (2003) examined the impact of trade liberalisation in the SADC region. While Udeagha (2017) examines whether multiple membership in regional trade agreements matters, Afesorgbor and Van Bergeijk (2011) investigated the effects of ECOWAS and SADC on bilateral trade flows within West and Southern Africa.

Despite the contribution of these studies, the question of the real trade Bloc impact on poverty reduction in member nations in Africa remains underexplored. The study by Gould and Ruffin (1995) noted that inter trade allows countries to acquire the right human capital and physical capital needed for their production, thereby improving the factors of

production in a country. They also highlighted that the benefits from these trades will lead to a subsequent increase in well-being and overall output volume as productivity and production improve, and as such, promote both economic growth and economic development. This indicates that an increase in TBs is a possible tool for poverty reduction, why we will explore it in this study. Secondly, it seems that there is no comprehensive quantitative analysis of how these Trade Blocs affect the fight against poverty in Africa as a whole. This means that strategies that will promote Africa's rapid economic development require a thorough scientific understanding of the role that trade Blocs play on poverty reduction in the continent. Thus, the study aims to add to the body of knowledge by experimenting whether or not African nations' membership in trade blocs has significantly reduced poverty from the year 1995 to 2023.

1.6 Organisation of the Research Report.

The study is structured and organised as follows: Chapter one is the introduction and background of the research. Chapter two presents our literature review. Chapter three: research methodology, chapter four: Results of the findings, and chapter five details conclusion with policy implications.

CHAPTER TWO: LITERATURE REVIEW

Introduction

This chapter provides a theoretical and empirical review of the study. The chapter is divided into five sections: The first section provides the theoretical review of the study, while section 2.2 presents the history of Africa's Trade agreements. Section 2.3 looks at the overview of Africa's trade Blocs used for the study, and Section 2.4 provides the process of poverty reduction, followed by empirical literature review section.

2.1 Theoretical review

Over the years, theories regarding trade openness and economic growth have expanded. Smith (1776) was the first economist that wrote a theory about the effect of trade openness. He noted that trade and competition are good for the efficiency of the economy. Smith, noted that through competition, resources are used most efficiently, and as such, countries benefit from trade. Ricardo (1817) expands on the theory and states that countries also benefit from trading together through the theory of comparative advantage. Comparative advantage, he believes, can be created by producing goods in which a country has a comparative advantage to produce on a large scale, thereby lowering its costs. Therefore, when countries trade these goods with each other, it provides more economies of scale and more efficiency in the market. Krugman, (1992) extends the trade theory even further saying that even countries that have no comparative advantage can still benefit from trade when these countries produce on a larger scale, thereby creating economies of scale which allows them to produce at a cheaper cost compared to others who do not produce on a large scale. Although Hussain and Ahmad (2022) recognised that factors such as labour and capital are not evenly distributed around the world. But then Heckscher Ohlin (H O) theory noted that trade can bridge this gap by getting countries to trade in their excess attributes, which can lead to a closer equal factor price. Schumpeter (1946) also noted that innovations from trade cause a dynamic process of economic development.

Several theories have also been used to explain the possible relationship between trade integration and poverty reduction. The country similarity theory by Linder (1961) explains why countries at the same level of development should trade with one another, maintaining that countries at similar stages of economic development and with common consumer preferences should engage in international trade of manufactured goods. The explanations

given by Linder relates to the essence of the country similarity theory, which suggests that a significant portion of trade in manufactured goods should take place between countries with comparable per capita incomes. The customs union theory, on the other hand, explains an agreement in which two or more countries have agreed to reduce or eliminate tariffs and other barriers to trade. Viner, (1950) posits that a customs union is market integration where members typically implement a unified external tariff on imports from countries that are not part of the union. Custom union aims to promote trade among member nations by protecting their domestic industries from foreign competition. Taking cognisance of multiple trade blocs in Africa, we will look at some of the prominent ones according to their historical backgrounds and characteristics as we transition into discovering their poverty reduction traits.

2.2 Review of the History of African Regional Trade Blocs

Numerous trade theories and studies exist for African Trade Blocs. Accordingly, Omilola (2011), noted that the Common Market for Eastern and Southern Africa (COMESA), the Southern African Development Community (SADC), the East Africa Community (EAC), the Economic Community of Central African States (ECCAS), the Economic Community of West African States (ECOWAS), the Arab Maghreb Union (UMA), and the Southern African Customs Union (SACU) are the most prominent regional groups in Africa. However, Africa is acknowledged to have more than 20 active regional groups now. (*Demonstrated in Table 1*) Alemayeha & Kibret (2002), also noted that most of these regional integrations can be traced back to pre-colonial and colonial eras, when trade blocs like SACU and the EAC were created in 1910 and 1919, respectively. Following them, several other trade blocs were formed across the continent. According to Ebaidalla and Yahia (2014), every African country is currently a member of at least one TB.

Africa, when we talk about cooperation and trade integration, offers extensive experience and dates back to the 70s. However, the benefits of trade are yet to be realised in terms of raising living standards and poverty elimination in Africa. During the colonial era, regional trade blocs in Africa faced several challenges, including the formation of geographically constructed nations with fragmented boundaries, which resulted in high communication costs, disputes, ethno lingual divisions, and other trade barriers (Alesina et al., 2011).

However, after their independence, more leaders established more connections with their neighbours, resulting in the Lagos Plan of Action in 1980 with the Organisation of African Unity in 1982. In addition to existing accords, new agreements were signed on the continent to promote African growth and development (Winter et al, 2004). Among the LPA's main goals is to develop and integrate Africa through an import substitution industrialisation plan, which was intended to be a catalyst for globalisation and a stepping stone between the colonial past and a new democratic system (Long & Sekkat, 2004). The African state governments worked together to establish the LPA, which was supported by the United Nations for Africa (Brabant, 2000). As a result, early 90s saw a new dimension of RTAs, the time when the Abuja treaty got established for strengthening the existing LPA and support the realisation of LPA objectives (Ademola, 1997). Among the goals is also, to empower economic cooperation and integration across the continent of Africa by offering substantial assistance to both the current and the establishment of more RTAs to accelerate intra African trade, with other TBs coming into play henceforth across the continent (Afesorgbor et al, 2011). The 1999 Sirte Declaration was an additional step towards ensuring a successful implementation of the LPA, Abuja treaties with other RTAs in 2000 (Jordaan, 2014). Some of the RTAs still face many challenges, plagued by weak institutions and poor policy implementation hurdles (Afesorgbor et al, 2011).

However, The African Continental Free Trade Area (AfCFTA), created in 2018, adopted in May 2019, and formally Launched in 1 January 2021 remains the continent's most active regional agreement. AfCFTA is not fully employed in our study because of its relatively recent development which limits its data availability within our time frame. Its primary goals remain to boost and strengthen Africa's potential in international markets and increase intra African trade within the continent (Ihua, 2018).

Despite Africa's engagement in various RTAs and the quest to transform continental African economies into one single market, to improve continental competitiveness through economies of scale, foreign direct investment, and export-oriented growth; Africa still faces many challenges, some of the challenges coming from lack of harmonisation, unnecessary and long negotiation by some members and inability to initiate and apply supportive institutions and policies. Also, there is the problem of belonging to many trade agreements, which constitute a uniform challenge in carrying out some of the required policies within the RTAs (Riedel & Slany, 2019). The next part concisely discusses the most prominent RTAs in Africa with their historical backgrounds, abnims and objectives, main characteristics, membership compositions, and intra-regional trade potentials and challenges.

2.3 Overview of Africa's Regional Trade Blocs used in the study

The section provides a detailed description of major regional TBs in Africa, Those that are used in the study. They are listed in no specific order as follows:

2.3.1 Arab Maghreb Union (UMA)

UMA was established in 1989 with cultural, linguistic, and historical links to Tunisia, Libya, Algeria, Mauritania, and Morocco (Bergs, 2004; Joffe, 1994). The principal North African trade bloc is the UMA. The UMA is unique in that only Arab nations outside of Africa are eligible to join (Testas, 1998). Countries in the Maghreb region, from Mauritania to Libya, had to unite to create a collective response because of the early locust invasion. The UMA's founding contract was later ratified in Marrakech in 1989. The UMA offered venues for fostering greater economic integration and collaboration among member nations through bilateral and multilateral initiatives like trade shows and cooperative projects.

There are roughly 30 active projects that are listed in the bloc. According to Testas, (2002), the UMA member nations have increased their technical collaboration. Although Finaish and Bell, (1994) have demonstrated that intra UMA trade is unstable, negligible, and unbalanced, according to the UMA's official trade records, Libya is the largest importer, accounting for roughly 45% of all intra-regional imports, followed by Algeria and Tunisia (20% each). Tunisia and Morocco are the largest exporters, accounting for roughly 23% and 46% of the total intra-UMA trade, respectively.

While UMA gained the highest GDP per capita relative to Sub-Saharan African Trade blocs, with targeted cooperation. Political tension (e.g., Morocco-Algeria), and Arab Spring-era disruptions restricted its progress causing Intra-AMU trade to remain marginal.

2.3.2 Southern African Customs Union (SACU)

According to Kirk and Stern, (2005), SACU is Africa's oldest operational customs union. Draper, Halleson, and Alves, (2007) state that SACU was established in 1910 as a result of a customs union agreement between the Union of South Africa at the time and the High Commission Territories of Swaziland, Botswana, and Lesotho. The fifth and last member to join is Namibia in 1990 (Qobo, 2007). Customs taxes between member nations were eliminated by their 1969 agreement, and commodities from outside the common customs area

were subject to uniform duty rates (Tavares and Tang, 2011). Later, their board of commerce and industry evolved in South Africa, established in 1921 and tasked with part time manufacturing development. As a result, the extensive 1925 Customs Tariff was put into effect (Lumby, 1983). Thus, the uniform external tariff greatly benefited South Africa by encouraging domestic industry in their customs union (Omilola, 2011). This greatly bolstered the manufacturing sector for South Africa. Smaller economies like Lesotho and Eswatini also benefited from the smooth flow of products between member states and the robust fiscal transfer system made possible by the trade agreement. Their partnership with the EU, grants SACU preferential goods access into EU markets thereby fostering regional trade and growth, thus representing a good example of how SACU has increased commercial links with outside partners.

SACU remains Africa's most enduring and institutionally established customs union, successfully achieving tariff-free trade and coordinated external trade policies for over a century, with intra-trade flows of 20%. Modern reforms like digital customs platforms and regional agreements have improved integration. However, deep asymmetries, policy fragmentation, revenue volatility, and dependence on South Africa limit SACU's ability to foster inclusive development across its members. The exclusion of services from the union, along with persistent institutional and structural barriers, continues to hinder its broader economic potential (WTO, 2023)

2.3.3 Southern African Development Community (SADC)

In 1992, the Southern African Development Coordination Conference (SADCC) gave rise to SADC. Mauritius, Lesotho, Zimbabwe, Angola, Tanzania, the Democratic Republic of the Congo, Zambia, Malawi, Botswana, Mozambique, South Africa, Namibia, Madagascar, Seychelles, and Swaziland are currently among the 15 SADC members. Over 230 million people live there in total (Flatters, 2002). South Africa's currency is the primary currency of the SACU, which is a common monetary area and customs union that includes several SADC member nations (Lewis, Robinson, and Thierfelder, 2003). SADC has the highest GDP of any African RTAs (Lewis, 2001). The result of its trade protocol is the SADC Free Trade Area (FTA). To improve regional growth, SADC approved a 15 year Regional Indicative Strategic Growth Plan in 2003 (Khandelwal, 2004). In this context, significant efforts have been made to facilitate trade. These include among other things, streamlining customs transit inspection reports and trade related processes (Chauvin and Gaulier, 2002). Over the past ten

years, SADC nations have greatly profited from robust economic performance brought about by better internal policies and favourable external conditions. Between 2003 and 2008, SADC commerce increased by about 6% a year, which was the fastest growth rate in the ten years preceding the 2008 and 2009 global financial crisis (Simwaka, 2011). The SADC Industrial Development Policy Framework and the Regional Infrastructure Development Master Plan, which aims to improve cross border transport and energy networks, are two examples of policies that support industrial development and promote regional integration, according to the SADC Secretariat (2005). The success of SADC's trade liberalisation efforts has increased commerce in products and services and drawn substantial international investment, especially in the mining and energy sectors. The bloc is a desirable location for regional investment and tourism due to its commitment to political stability.

SADC's framework has provided significant institutional and strategic gains; a free trade area, trade facilitation protocols, industrialisation roadmap, and targeted infrastructure improvements. However, intra-regional trade remains low at about 18% in mid-2025 due to non-tariff barriers, weak industrial capacity, and regulatory inconsistency (All Africa, 2025)

2.3.4 The East African Community (EAC)

Established in 1967, EAC failed in 1977 before reviving in 2000. Burundi, Tanzania, Kenya, Rwanda, and Uganda comprise the Community. In the colonial era before the EAC, Kenya and Uganda had an internal market with the former Tanganyika (Milner et al., 2005). Tax harmonisation, a monetary union, a common customs tariff, and common services (including creation of universities, research institutions, ports, communication, and railways) are all part of the EAC's strategy plan (Coulibaly, 2004). Before the complete establishment of the union, intra EAC trade had been greatly expanded, as seen by low importation tariff among members.

Prior to establishment of the resurrected EAC in 2004, Kenya typically applied for 90% lower preferential tariff on imports from other member nations, according to UNCTAD (2004). The tariff regimes of Tanzania and Uganda were also liberalised, and intra-regional commerce has been boosted by the complete elimination of non-tariff trade barriers. According to UNCTAD (2004), the average tariff rates within the EAC are lower for Tanzania, Uganda and Kenya, respectively, whereas the average tariff rates outside the community were much higher. A Customs Union and Common Market, which facilitate commerce and labour movement

throughout the area, are just two examples of the EAC's impressive advancements towards deeper integration (UNTAD, 2004). To standardise economic policies across its members, encourage trade, and lessen currency volatility, the EAC has also sought to create a Monetary Union. Furthermore, by linking landlocked member countries to ports and markets, infrastructure initiatives like the Northern Corridor Improvement Project fostered trade in the region. While the EAC has achieved significant milestones in regional integration, the persistent challenges of NTBs, infrastructure deficits, policy inconsistencies, and limited industrialization hinder the full realization of its trade potential as intra-EAC trade accounted for only 15% of the region's total trade in 2023, indicating a limited internal trade volume relative to external trade (All Africa, 2023)

2.3.5 Economic Community of West African States (ECOWAS)

ECOWAS was founded in 1975 by sixteen West African countries members which includes Togo, Niger, Guinea, Nigeria, Benin, Gambia, Liberia, Sierra Leone, Cape Verde, Burkina Faso, Mali, Ivory Coast, Senegal, Guinea Bissau, Ghana, and Mauritania, Although Mauritania left in the year 2000. Its goals include eliminating barriers to the free movement of capital, services, goods, and people, developing a unified commercial policy, and establishing customs taxes for non-members. To promote trade among member nations, it also offered strong financial institutions, a functional road network, an efficient transit system, and an improved communication network. According to Hanink and Owusu (1998), the community has effectively developed a sizable number of institutions entrusted with overseeing daily operations in the area and fostering intraregional trade. According to the International Trade and Economics Series (2015), ECOWAS has been particularly successful in fostering social cohesion and freedom of movement throughout West Africa. By lowering tariffs and facilitating the free movement of goods, its Trade Liberalisation Scheme fosters the development of regional value chains in order to preserve political stability, which is essential for long term economic progress. ECOWAS has also taken an active role in creating a Peace and Security Architecture. Additionally, by removing currency exchange restrictions, the Bloc is promoting the "ECO," a single currency program that aims to increase intra-regional trade.

ECOWAS remains a vital political and economic force in West Africa with well-established frameworks for integration, freedom of movement, institutional structures, and

conflict-resolution capacity. However, it still faces considerable structural hurdles: notably low intra-regional trade volume comprised of only 12% in 2024, persistent non-tariff barriers, political fragmentation and corruption due to internal instability and the Sahel secession, weak enforcement mechanisms, and deep socioeconomic disparities (ISS, 2025).

2.3.6 Economic Community of Central African States (ECCAS)

ECCAS comprises 11 countries with Angola as the newest member, other member are Sao Tome and Principe, Congo Democratic Republic, Gabon, Chad, Rwanda, Central African Republic, Burundi, Equatorial Guinea, Cameroon and Congo Republic and formed in 1983 (Musila, 2005). Although, ECCAS is known as a building block in the Central African subregion. Darku and Appau (2015) noted that intra-regional trade in the Central African region under ECCAS has remained very small. ECCAS trade situation has been associated with difficulties in policy implementations. Instead of empowering trade the committee are said to have also used instruments that militated against the efficient allocation of resources for the region (Avom and Njikam, 2015; Olivia, 2008). Despite various improvement recorded since establishment, ECCAS remains the least integrated REC in Africa, with intra- regional trade representing just 2% of its total trade, far below other continent-wide averages.

2.3.7 Common Market for Eastern and Southern Africa (COMESA)

COMESA members are Zambia, Uganda, Sudan, Rwanda, Mauritius, Malawi, Madagascar, Libya, Kenya, Ethiopia, Eritrea, Egypt, Djibouti, Congo DRC, Comoros, Angola, Burundi, and Zambia. It was formally established in 1994 but started as a preferential trade area in 1982. In 1994, it changed its name to COMESA (Murinde, 2001). It is in quest to foster commerce, investment, and infrastructure development throughout eastern and southern Africa that COMESA was established (Ebaidalla and Yahia, 2014). To establish a shared market and economic community throughout the area, COMESA established a Free Trade Area (FTA) in 2006 and a customs union in 2007, respectively (Dimaranan and Mevel, 2008). For member nations, COMESA has been a useful instrument for advancing cooperative industrial policies and trade integration. The bloc's free trade area and efforts to reduce trade barriers have significantly boosted both foreign investment in its member countries and intra bloc commerce. By strengthening regional economic ties and diversifying trade routes, COMESA achieved notable progress in institution-building, facilitating trade, and digital integration,

with the Virtual Trade Facilitation System (CVTFS) and Yellow Card scheme standing out as practical successes. COMESA's integration efforts have improved economic resilience. However, its intra-regional trade share remains modest, burdened by structural export similarity, informal trade, and weak domestic implementation of agreed protocols (AUC, 2022).

2.3.8 A Statistical Overview of Heterogeneity within Sampled Trade Blocs

Although Africa's regional integration agenda, anchored in eight African Union-recognized Regional Economic Communities (RECs), serves as the building blocks of continental integration under frameworks of AFCFTA, with each representing a distinct level of economic development, trade performance, infrastructure readiness, and institutional capacity. However, recent data reveal diverse levels of heterogeneity among these blocs in terms of intra-African trade shares, tariff regimes, infrastructure connectivity, and institutional effectiveness. According to Tralac (2021), the share of intra-African exports varies significantly across RECs. The Southern African Development Community (SADC) leads with 32.1%, followed by COMESA (20.3%). In contrast, ECCAS (5.9%), EAC, and AMU (5.4%) lag, indicating fragmented trade within Central, East, and North Africa (Tralac, 2021).

This variance reflects the uneven depth of market integration and industrial development across the region. SADC's improvement is partly due to South Africa's industrial base and regional transport corridors. Meanwhile, despite its customs union, EAC accounts for less than 5% of intra-African trade, pointing to challenges in product diversification and manufacturing capacity (Tralac, 2021).

Under Tariff Regimes and Policy Fragmentation, EAC maintained a 0% average intra-regional tariff, signalling a fully operational customs union. COMESA and ECCAS applied moderate average tariffs of between 1.8 to 1.9%, while ECOWAS (5.6%) retained higher protection levels (Brill, 2020). These variations affect price competitiveness, supply chain formation, and regional value chains. For instance, higher tariffs in ECOWAS deter integration in sectors like Agri-processing and light manufacturing, while EAC's tariff-free trade has stimulated modest cross-border commerce in grains, steel, and dairy.

The composition of Export trade reveals divergence across the Blocs with 41% of intra- African trade in 2019, comprising processed goods, such as chemicals, machinery, and textiles, indicating progress toward industrialization in blocs like SADC and COMESA (UNCTAD, 2021). In contrast, ECCAS and EAC remain reliant on primary commodities such as oil,

minerals, and agricultural products. For instance, EAC members export mostly raw tea, coffee, and base metals. While under SADC, South Africa's relative manufacturing strength still derives over 65% of its trade from mineral resources or unprocessed goods (UNCTAD, 2022). Also, is the problem of Overlapping Memberships and informal trade, which remains high in COMESA and SADC (estimated at 30% to 40% of total trade). These informal flows, which are unrecorded, include food, textiles, and household goods that support millions of livelihoods. However, they complicate data collection and policy targeting (UNCTAD, 2021). Furthermore, overlapping REC membership creates policy incoherence whereby countries such as Kenya, Uganda, Rwanda, Burundi, Tanzania, Zambia and DRC (in EAC, COMESA, SADC, and ECCAS) face conflicting rules of origin, divergent tariffs, and customs procedures, delaying AfCFTA harmonization and frustrates exporters, creating a "spaghetti bowl" of overlapping regional organizations which tangles membership, complicates trade policy, leads to double counting in trade statistics, and places administrative and compliance burdens on member states. Tralac (2021)

2.4 The link between trade and poverty reduction.

The fundamental mechanism by which trade reduces poverty stems from the theory of sustainable economic growth, which holds that trade can reduce poverty by directly influencing member countries' economic growth rates. As a result, member countries are compelled to increase their production capacity in order to meet the demands of their exports, thereby increasing labour demands and productivity levels.

Several studies highlighted the significance of labour-intensive growth when examining the kind of growth that might be more successful in reducing poverty. For instance, Squire (2003) and the World Bank (2010) acknowledged that economic growth encourages the productive use of labour, which the main asset is held by the poor, since it gives them access to money. It is possible to conceptually analyse the connection between poverty, employment, and economic growth. At the macro level, the relationship between output growth and poverty in its income dimension can be reinforced by considering the average productivity of employed workers, which is reflected in real wage levels and total earnings from employment. The same linkage functions at both household and macro levels through the kind of economic activities that the household's members engage in, the workforce's level of human capital, the burden of dependency that may restrict the labour participation rate, and the accessibility of opportunities that pay well. Employment possibilities with increasing

productivity can be attained when rapid economic expansion results in a sustained increase in productive capacity. This can encourage the underemployed and jobless labour population to gradually integrate into growing economic activity with increasing income levels. Whereby the improvement may be able to boost their productivity level, which will raise incomes from their current jobs, or give them the opportunity to move to other profitable industries that, may raise their real salaries and employment earnings, thereby increasing their standard of living. The higher earnings that would follow would then allow workers to invest more in their own and their children's education and skill development, increasing further the future workforce's potential for productivity and laying the groundwork for greater economic growth. Thus, the procedure would fetch positive feedback loop of economic expansion, reducing poverty by increasing employment and productivity, the growth that is referred to as pro poor growth.

According to the OECD (2009) and DFID (2008), economic growth remains an effective way to reduce poverty, and Trade on the other hand very essential in achieving economic growth that will help in alleviating poverty. Bacrot & Valensisi (2019), highlight that trade integration is an intricate process that can lead to an increase in the volume of trade, thereby improving competitiveness and the level of economic growth that will lead to economic development.

While African trade blocs like the UMA, SADC, and ECCAS have improved trade flows, reduced tariffs, and encouraged investment within the regions, Ndirangu (2010) pointed out that obstacles like poverty, political unpredictability, and infrastructure constraints still prevent some member states from reaping the full benefits of these trades. Because of this, intraregional trade between African nations are still relatively low. However, the ability to harmonise tariffs and loosen trade restrictions shows promise in the manufacturing and agricultural sectors, where better access to markets helps some regions' GDP growth and employment, which this study aims to confirm.

Since its official founding in 1993, the European Union (EU) Single Market has significantly influenced the region's economic development and progress. The Single Market has boosted commerce, improved productivity, and maintained economic cohesion inside the EU by allowing the free flow of capital, labour, products, and services among its member states. According to Ndirang, (2010), the European Union is a more successful and integrated regional trade arrangement on a worldwide scale. Additionally, he pointed out that the EU's customs union and single market have promoted broad economic policy coordination,

enhanced capital mobility, and increased commerce. The EU has improved economic resilience and productivity in all of its member states by lowering trade barriers and promoting competition. Stable economic growth has resulted from this high degree of integration, with market access and infrastructure investments benefiting all members and surrounding nations, thereby promoting economic cohesion. Since the 90s, the European Union has played a crucial role in greatly increasing intra-European commerce through trade and market access (the removal of tariffs and the lowering of non-tariff barriers). According to research by the European Commission (2020), trade liberalisation inside the Single Market has improved competitiveness by giving companies access to a wider market in addition to lowering prices for consumers. As stated by the European Parliament in 2019. Alleviating shortages of labour, improving skill distribution throughout the area and decreasing unemployment rate with the freedom of workers movement allows EU residents to work in any member state, thus promoting growth and progress. Numerous studies have shown that by enabling workers to move to regions where their talents are more in demand has improved labour productivity and decreased unemployment gap.

Additionally, the ease of doing business across EU blocs was enhanced by the lowering of regulatory standards in areas like data protection, product quality, and environmental safety. Research indicates that by upholding high standards across all member states, these unified regulations not only make compliance easier but also increase customer confidence. As demonstrated in the consumer goods and medical industries, where regulatory harmonisation improved access to high quality products, fostering economic growth and innovation (World Bank, 2020). Economic differences among member countries were lessened by regional economic integration in the EU markets. The EU was able to invest in public services, infrastructure, and economic projects in its less developed areas by using funds such as the Cohesion Fund and the European Regional Development Fund. Studies conducted by the European Commission (2020) indicate that these grants helped create jobs and enhance infrastructural developments which have amounted to a greater increase in economic growth that boosted economic development in the region, particularly in Southern and Eastern Europe. As indicated by Chang (2007) there are economic welfare gains of regional trade not only for the EU but also for East Asian countries, such as China, Japan, Hong Kong, Korea, Singapore, and Taiwan, which are all linked to their trade integration.

Notwithstanding the expanded literature on the positive impacts of trade on poverty reduction across the globe, Africa still seems to be failing to maximise their trade integration, as it

remains the poorest region of the world despite its regional trade having grown in recent years. *Are the gains from trade equally distributed across all regions in the world?*

Despite the experience of the European and Asian worlds, experts continue to debate the impact of regional trade in Africa, particularly in Sub-Saharan Africa. (Mayes, 2018), maintains that regional commerce can truly nurture and accelerate growth by fostering trade convergence rather than diversion, resulting in better human welfare, of which this study aims to validate for Africa.

2.5 Empirical Literature Review

Since examining the relationship between trade integration and poverty reduction appears to be a challenging task, academics have used a variety of estimating methodologies with varying sample sizes and time periods to try and ascertain the relationship between them. The quest for a connection between trade integration and poverty has also employed a variety of trade integration metrics. The results of these empirical analyses of the trade-growth link are surprisingly inconsistent. Empirical studies by Krishna & Panagariya (2002) and Feenstra (2003) have provided evidence that both customs unions and free trade agreements can be beneficial to participating members. However, Feenstra (2003) emphasizes the need to avoid assuming that regional integration agreements are inherently positive in practical terms.

Hammouda et al. (2009) examined the implications of the regional integration process for income convergence among countries in Africa and revealed that the convergence process within RECs has been generally weak and between-country inequality has increased in SADC and in the Economic Community of West African States (ECOWAS).

Using data from 2005 to 2014, Onakoya et al. (2019) examined the potential relationship between trade integration and poverty reduction in 21 African countries. The panel unit root test, pooled OLS approach, cointegration test, descriptive statistics, correlation matrix, and variance inflator were all employed in the study. The results indicate a positive correlation between foreign direct investment, inflation rates, and human development index. Conversely, there was a negative relationship between exchange rates and trade integration and poverty at 5% significance level, suggesting policy reforms aimed at restructuring poverty reduction initiatives. They added that developing countries should work with other developing countries to enhance South- South cooperation. This suggests that countries with similar demand patterns and levels of development should engage in bilateral trade. Bui et al.

(2016) investigated how economic integration affects poverty and inequality among rural families in Vietnam. After adjusting for fixed effects and any possible biases, they discovered that economic integration has little and statistically insignificant impact on household welfare. The study suggested that to successfully reduce poverty, policy objectives should include a component that redistributes resources at the family and community levels and promotes macroeconomic growth. However, a study by Guerineau (2016) found that economic integration may significantly impact poverty reduction, even when the “growth channel” is weak. Ametoglo et al. (2018) examined the relationship between regional integration and inequality within ECOWAS from 2004 to 2013. They employed the least squares dummy variable corrected (LSDVC) regression method for their analysis. The results indicate that political integration has a moderating effect on income disparity, but economic integration increases income gap.

Park & Claveria (2018) developed a multidimensional regional integration index series to examine the impact of regional integration on inclusive growth. The study used the system generalized method of moments (SGMM) and showed that even when trade and financial openness are regulated, regional integration significantly and positively impacts poverty reduction, income distribution, and economic growth. The result also indicated that different dimensions of integration have varied impacts on growth, income inequality, and poverty, suggesting that greater infrastructure and connectivity lead to a reduction in the income gap, while trade integration and investment, money, and finance as well as institutional and social integration have a negative effect on poverty. Similarly, Santos-Paulino et al. (2019) analysed how regional integration affects growth, income distribution and poverty reduction in the global context using a dynamic model. The results show that regionalisation is growth- enhancing and contributes to inequality and poverty reduction in low and middle-income countries. However, they noted that the effects are location dependent and regionally based as they also found that regional trade agreements would increase poverty in sub-Saharan Africa. Ametoglo et al, (2018) analysed the effect of RTI on within-country inequality in ECOWAS between 2004 and 2013. The findings suggest that trade integration, measured by the intra- regional export ratio, and would lead to an increase in within-country income disparities while political integration has an overall negative effect on inequality.

Using panel data and smooth transition regression with instrumental variables like trade share, import and export ratio, Kinfack and Bonga Bonga's (2023) recent study on the relationship between trade integration and economic development in African countries found

a positive relationship for high income African countries but a negative relationship for low-income African countries. However, Le, Chang, and Park (2016), in addition to Kinfack and Bonga Bonga (2023) added total exports as a percentage of GDP, in addition to the import and export ratio as metrics for trade integration and found a positive relationship between trade integration income earnings of most African countries.

Other developing countries, such as Brazil, China, India, and Mexico, experienced rapid economic development following Regional Trade Agreements. Most of them made significant policy adjustments to foster these integrations, including lowering tariffs and other trade barriers, reducing barriers to foreign direct investment (FDI), and entering into other complex trade agreements. The main motivation for these changes was the promise of growth, higher wages, and lower wage differentials. (Harrison 2007). Lederman, Maloney, and Servén (2005) discovered that NAFTA had positive impacts on trade and productivity in Mexico, with modest impacts on wages and the convergence of income per capita.

According to Robertson, (2013); The North American Free Trade Agreement (NAFTA) significantly boosted Mexico's export sector, particularly in manufacturing and agriculture, leading to employment growth, especially in northern Mexico. Manufacturing wages in border cities like Tijuana and Ciudad Juárez improved relative to non-border regions, lifting many households above the poverty line. The agreement led to a surge in export-oriented assembly plants (*maquiladoras*), which employed over 1.3 million workers in 2005, many of them previously in poverty.

In another study conducted by Wang et al, (2022) using China–ASEAN provincial constructed panel data spanning from 2000 to 2017, across 27 Chinese provinces, using measures such as exports & imports relative to GDP and various poverty indices such as poverty gap, income level, under-insurance count, found that a 1% increase in port efficiency corresponds to approximately a 1.051% reduction in the poverty index, implying that ASEAN integration significantly contributed to poverty reduction.

Many other studies also assessed the impact of trade integration on poverty reduction (e.g., Bui et al., 2016; Onakoya et al., 2019; 2021; Umeh et al., 2021; Yameogo & Omojolaibi, 2022; Ilyas et al., 2023; Ozigbu, 2023; Each study came up with different relationships and significance of trade integration on poverty reduction. However, none was conducted on the impact of trade integration on poverty reduction for the seven Prominent African Trade blocs.

Therefore, this study will contribute to existing literature, firstly, by focusing on the prominent African Trade Blocs with their integration initiatives to capture the poverty reduction impacts of these Trade Blocs on the African Continent. Secondly, the study will look at the poverty reduction effect of these Blocs on the African countries that share borders, considering factors such as existing institutional arrangements, Bilateral flow of export & import, poverty Headcount, Literacy level, access to finance, inflation, population size, etc. As these factors will help to shape the extent to which African countries are able to leverage the proceeds of trade integration for job creation, income growth, and income per capita for the poor, which will then help to determine if these proceeds are pro-poor.

CONCLUSION

From the review of both theoretical and empirical literature on the relationship between trade integration and poverty reduction; Studies revealed mixed outcomes with positive and negative effects, following varied samples, techniques, and variables. However, studies assessing Trade Blocs as a channel through which trade openness can affect poverty reduction are limited, as many studies could not ascertain if TBs can reduce poverty specifically for economies that trade together. Following the detailed theoretical and empirical discrepancies, the study aims to contribute to the available literature by revealing the poverty-reducing effect of TBs in Africa using a scientific empirical method.

CHAPTER THREE: RESEARCH METHODOLOGY

Introduction

Chapter 3 details the research techniques and methodology. The first section describes the theoretical framework of the study. Section 3.2 justifies the estimation techniques while Section 3.3 displays the econometric specification used to investigate the relationship between trade blocs and poverty reduction. Following that, a detailed explanation of the estimation techniques used in the study is given in section 3.4, with the measurement of trade Blocs in section 3.5. Finally, Variables and their data sources are detailed in section 3.6 including a table for our sampled country.

3.1 Theoretical Framework

The economic implication is that TBs' poor economic participants stand to benefit more from trade once tariffs and non-tariff barriers are eliminated; given factors like shorter distances, which imply low transportation costs for the trading partners. The context also explains why unskilled labourers and poor entrepreneurs are likely to participate in and benefit from TBs with closed proximity, which could potentially reduce poverty as young entrepreneurs have access to nearby markets. Although; for the wages of the unskilled labour force to increase due to comparative advantage, there must be a current capacity to shift production from the contracting sector to the expanding ones (Goh & Javorcik 2006; Topalova, 2010).

The poverty reduction framework is also embedded in 'trickle-down theory', which postulates increase in production as having a deterministic feature on the reduction of poverty because of its pivotal redistributive impact it has on average income which also require high productivity level for growth to happen; Thereby, having a positive impact on the poor as their living standard improves. This indicates that policies that should reduce poverty should be targeted firstly to boost economic growth so that it will subsequently bring about poverty reduction.

The study also uses the theory of comparative advantage, which was put forth by Stolper Samuelson, to evaluate the effect that TBs has on poverty; the idea which support trade liberalisation as the primary driver of poverty alleviation. According to this hypothesis, trade will have a favourable impact on unskilled workers' earnings, promoting employment and economic growth and so lowering the poverty level. Accordingly, the Stolper Samuelson theorem; maintain that trade liberalization in developing countries should be able to draw unskilled labour into employment and as such increase their real wages over time. (Krugman,

Obstfeld, & Melitz, 2015) In other words, the abundant factor's real revenue is expected to increase when tariffs, quotas, and licenses on low skilled items produced in developing nations are reduced or eliminated. As a result, tariff reduction and increased open trade will promote growth thereby influencing technical spread which will positively impact poverty reduction (Krugman, Obstfeld, & Melitz, 2015).

Following many attempt to signify trade policies that will be used to ascertain poverty reduction effects of trade in an economy and hypothesise that link to poverty reduction in an economy; various theories and scientific investigation have been carried out, from which variables such as but are not limited to, TBs the main dependent variable, GDP per capita, Education, inflation, health expenditure by government, international remittance, population growth, inequality, financial development, institution and governance in a country are identified. The basic framework of the variables with their hypothesised correlation with the rate of poverty is explained further in the study:

TBs, can reduce poverty by firstly improving the economic growth of a country through an increase in technology that can improve the production of goods, whereby more production requires more labour demands and subsequently improving the standard of living of employed workers, leading to poverty reduction.

Contiguity, which we use interchangeably with “proximity”, is used to describe the geographical linkage or distance between two countries that trade together. Trade theories believe that geographically close countries tend to trade more with each other than those that are farther apart. The resultant effect is explained by (Long, 2008) as having a positive effect by reducing the transportation cost, conflicts, cultural barriers, and language barriers which militate against trade. World bank (2013) also explained that the flow of trade between two countries that trade together is inversely proportional to the distance between them. Which means, the closer the countries the higher the trade volumes and benefits from trade which might include poverty reduction.

Educational attainment is believed to be a crucial factor that can empower people to acquire better skill to earn a moderate income that can take them out of poverty. More variables are discussed subsequently.

Inflation is another influential determinant of poverty reduction as it directly affects the purchasing power of the population and can harm the real wage of consumers as prices rise. An increase in price level is believed to have a worsening effect on the standard of living.

Talukdar, (2012) indicated that an increase in the prices of goods and services, negatively affect the purchasing power as it decreases the real wage and aggregate demand in the economy. The nexus of poverty and inflation is also demonstrated by Ravallion (1998) and Fischer (2000) where they indicated that the increase in nominal wages increases at a decreasing rate thereby decreasing the real wage of income earners, which subsequently reduces their disposable income thereby increasing the poverty level of wage earners.

Healthcare is another factor that can influence the poverty level of a country due to the fact that it is a basis of life. Mushkin (1962) considers health as a form of capital, as he believes that improvement in health improves physical and human capital, which leads to growth and subsequently, poverty reduction. Therefore, expansion of health expenditure by government represents a crucial tool in poverty reduction as it brings about improvements in productivity and production of goods with added ability to earn more, which will lead to the reduction of poverty. Therefore, the correlation of government expenditure on health and the level of poverty is negative, as the increase in government health expenditure and the subsequent positive healthy outcome will reduce the poverty level of a country (Mayer, Mora and Barona, 2001).

International remittance associated with trade brings a positive impact on the countries BOP as inflow of remittance from workers abroad increase countries inflows and affect family's poverty level as poverty reduces with more money flowing from the host country to home country.

The Population growth of a member nation also determines poverty level within a trade Bloc. Empirical evidence by Birdsall, (1980) shows that; the relationship between population growth and poverty reduction is positively correlated. He further explains that an increase in population growth reduces income per capita which further increases the incidences of poverty in a country, and as such decreases the standard of living of people as they struggle to get hold of the few available job opportunities and scarce resources. Consequently, rapid population growth reduces the income earned by the population as service delivery and government job creation prospects fails due to over population, which then serves as a barrier for people to get out of poverty.

The depth of financial development in a country also represents a deterministic feature of poverty reduction. This is also listed by the World Bank as one of the prerequisites to achieve poverty reduction. Studies by World Bank, (2011), Shows that improvement in a country's

financial system, is an important tool needed for inclusive development and poverty reduction for Africa, as it provides necessary information for rationalising their affordability of financial instruments and possible risk associated with them for possible extension and further development.

Quality of governance and institutions within a country also influences the poverty level of that country as both political and economic stability can provide the suitable environment for growth and development or militate against it. This means that a stable political order, free from corruption, with good accountability will enable pro poor policies among others to be implemented in a country.

Inequality level in a country can also determine the level of poverty in that country. This is because it is a known fact that increase in inequality level increases poverty level of a country; other things being equal. Inequality, measured with Gini coefficient which show the degree of inequality in country, show that when the inequality level in a country increase, so will be poverty as poor remains poor over a long time with the implication that; for poverty level to decrease, inequality level should also decrease and income equitably redistributed so that the poor are able to get out of poverty.

3.2 Estimation Techniques' motivation

To answer our research questions, pooled OLS, Random Effect (FE), Fixed Effect (FE) and GMM techniques were used. The subsequent section presents the motivation for our choice of techniques:

3.2.1 Pooled ordinary Least square, (OLS)

OLS is one of the traditional estimation techniques used in many empirical investigations to assess the trade effect of regional trade agreements because of its simple nature, although its application encompasses various problems which include biased coefficients where it might fail to account for sample biasness and might not control for unobserved heterogeneity which might lead to inefficiency in estimation. Nonetheless, OLS techniques are considered among the best in empirical study (Siliverstovs & Schumacher, 2009).

3.2.2 Fixed Effect (FE)

Fixed effect is a widely recognised estimation technique used when dealing with panel data analysis as it accounts for time invariance and individual-specific effects. However, Fixed

Effects have some drawbacks as it may reproduce biased estimates in the presence of a lagged dependent and large sample size, raising concerns for the reliability of the estimates. However, FE still tops the list of effective techniques when dealing with panel data (Caselli et al, (2006) ; Hauk & Wacziarg, 2009).

3.2.3 Random Effect (RE)

Random effects are more beneficial as it provides estimation for variables that do not vary over time for example distance and common borders that are time constant. Random effect also caters for binary and dummy variables by providing degrees of freedom to the descriptive variables.

3.2.4 THE GENERALISED METHOD OF MOMENTS (GMM)

Following several endogeneity problems associated with OLS estimation and the weaknesses of Fixed and random Effect, Researchers believe that, GMM approach should be used to guarantee that endogeneity problem and time invariant effects which GMM caters for to lessen endogeneity issues when estimating growth models utilizing dynamic panel data sets.

As a result, we use Arellano and Bond's (1991) Generalized Methods of Moments for Dynamic Model to further estimation of our equation 3.7 so that we solve the endogeneity issue that might result from using our dependent variable and as such reverse its biasness from the dependent variables considered with one lag period as a regressor.

3.3 Econometric Specifications and Functional form.

To empirically assess the poverty reduction impact of Trade Blocs on the African economy, we employ the dynamic panel data, and we also employ H-O framework of Stolper- Samuelson. The theory where trade liberalisation is advocated as an important stimulator of poverty reduction, and trade integration believed to directly impact the real wage of low- skilled workers through the theory of comparative advantage, which stimulates growth, improves the living standard and leads to poverty reduction.

Hence, we define our functional equation, where poverty is a function of trade as shown below:

$$POVT_{it}=(Trade) \quad (3.1)$$

We introduce other explanatory variables to the equation as:

$$POVT_{it}=(TB_{sijk};X_{it}) \quad (3.2)$$

X_{it} , in the framework, denotes other explanatory variables that influence poverty reduction in our study and includes bilateral import & bilateral export flows, international remittances, the level of inflation, the distance between countries that trade together, population growth, literacy levels, government expenditure on health, institutions, and financial development in a country. Poverty headcounts and poverty gap represent the dependent variables and the poverty measures used in the study. As such, the above equation is moderated to capture variables that contribute to the reduction of poverty and factors relating to our main variable, as expressed below:

$$POVT_{it}=f(TB_{sijt},GINI_{it},Dist_{ijt},GDPPC_{it},REM_{it},CONTG_{ijt},INF_{it},BIIMPORT_{it},BIEXPORT_{it}, POPN_{it}, LIT_{it}, HEA_{it}, FIN_{it}, INST_{it}) \quad (3.3)$$

From the above equation (3.3), TBs, our main independent variable, explains poverty reduction, which we expect to have a negative sign of effect, with others representing our independent variables. Further, we changed our functional form to an econometric equation as written in (3.4).

The model follows the assumption that TBs, which represent different regional trade Blocs in Africa, can reduce poverty by firstly impacting on growth of our sampled countries. This is because growth is an important channel that links our variables. The study uses the basic growth-poverty framework proposed by Ravallion and Chen (1997), as well as perceptions from other research on the macroeconomic determinants of poverty, such as Adams and Page (2005), to develop a formal empirical framework for poverty reduction and the determinants that vary across time and countries, as shown in the equation below.

$$POV_{it} = \alpha_1 + \varphi TB_{sijt} + \beta' X_{it} + \epsilon_{it} \quad (3.4)$$

Where the functional form (3.4) represents our simplest econometric form. Representing vector of the explanatory variables which varies with time.

3.4 Estimation technique

To answer our research question, we used two estimation method: OLS, and Random Effect. OLS is our first estimation technique and is carried out using equation (3.5), which is the expansion of equation (3.4) and takes the natural logarithmic transformation shown below:

$$\begin{aligned} \ln POVi_t = & \alpha_1 + \varphi \ln TB_{sijt} + \beta \ln GINI_{it} + \lambda \ln GDP_{PCit} + \alpha_2 \ln Dist_{ijt} + \vartheta \ln CONTG_{ijt} + \eta \ln REM_{it} \\ & + \pi \ln INF_{it} + \xi \ln IMPORT + \wedge \ln EXPORT + \theta \ln POPN_{it} + \delta \ln LIT_{it} + \psi \ln HEA_{it} \\ & + \gamma \ln INST_{it} + \omega \ln FIN_{it} + \mu i \\ & + \epsilon_{it} \end{aligned} \quad (3.5)$$

where t is the time period, i is the cross-sectional unit, and α_0 is the constant equation intercept.

The parameters to be estimated are $\alpha_2, \varphi, \beta, \sigma, \eta, \wedge, \pi, \delta, \vartheta, \psi, \theta, \xi, \omega$, and γ .

Individual specific effects that are not observed ϵ_{it} is the stochastic error term with standard properties, representing any other variables that can affect poverty reduction. $POVi_t$ represents

the poverty headcount and poverty gap; dependent variables, with poverty headcount representing the percentage of the population living below the poverty line in country i at time t , and remains the main poverty measure in the study, as well as the mean deviation relative to the poverty line. TB_{sijt} is a proxy for regional trade measured as a trade linkage, Gini coefficient proxied for income inequality; REM_{it} is international remittances as a percentage of GDP; The real GDP per capita is represented by GDP_{PCit} ; Inflation is denoted by INF_{it} ; Literacy is measured by LIT_{it} ; Health expenditure is represented by HEA_{it} ; Population size is represented by POP_{it} ; Financial development is indicated by FIN_{it} ; and the quality of the institutions and governance is measured by $INUNXjb$, trading countries that closed to each other are represented by $CONTG_{ijt}$, whereas the cost of transportation resulting from the distance between trading nations is represented by $DIST_{ij}$. All variables are in their natural logarithm form.

We further conduct another analysis using RE, which has an advantage over FE in that it can provide estimates for the independent variables that do not vary with time, due to the weak nature of OLS estimation in equation (3.5), which failed to account for time and individual specific effects, therefore we expect our technique to fix the problem of endogeneity related

to distance and common border which might have been omitted by FE estimation. To choose an appropriate estimating method between FE and RE, the Hausman test is conducted. Thus, the equation can now be used to estimate FE and RE as in equation (3.6).

$$\begin{aligned}
InPOV_{it} = & \alpha_0 + \varphi InTBS_{ijt} + \beta InGINI_{it} + \lambda InGDPPC_{it} + \alpha_2 lnDist_{ijt} + \vartheta InCONTG_{ijt} + \eta InREM_{it} \\
& + \pi InINF_{it} + \xi lnIMPORT + \chi lnEXPORT + \theta InPOP_{it} + \delta InLIT_{it} + \psi InHEA_{it} \\
& + \gamma InINST_{it} + \omega InFIN_{it} + \mu_i \\
& + \varepsilon_{it}
\end{aligned} \tag{3.6}$$

The α_i term represents specific fixed effects that show the existence of omitted unobserved heterogeneity and also used for endogeneity control which is usually encountered when carrying out empirical studies on poverty especially when using estimation techniques such as OLS, RE and FE among others, that can give rise to bias outcomes, especially when there is a possibility of endogeneity within the explanatory variables which may bring biasness to an estimation. To curb these possible problems, we employed the Generalised Methods of Moments (GMM) for the dynamic model proposed by Arellano and Bond (1991), because it can address the issue of endogeneity, unobserved individual specific effects that might negatively affect our estimation. Therefore, equation (3.7) represents the GMM model, which eliminates the unobserved individual-specific effects by carrying out the first differencing of the poverty model as shown in the model specified below:

$$\begin{aligned}
\Delta InPOV_{it} = & \alpha_0 + \alpha_1 \Delta InPOV_{it-1} + \varphi \Delta InCBT_{ijt-1} + \beta \Delta InGINI_{it} + \lambda \Delta InGDPPC_{it} + \alpha_2 \Delta lnDist_{ijt} \\
& + \vartheta \Delta InCONTG_{ijt} \\
& + \eta \Delta InREM_{it} + \pi \Delta InINF_{it} + \xi \Delta lnIMPORT + \chi \Delta lnEXPORT + \theta \Delta InPOP_{it} + \delta \Delta InLIT_{it} \\
& + \psi \Delta InHEA_{it} + \gamma \Delta InINST_{it} + \omega \Delta InFIN_{it} + \Delta \mu_i \\
& + \Delta \varepsilon_{it}
\end{aligned} \tag{3.7}$$

In (3.7), a one period lag is used to capture the state dependence effect of poverty rates in the developing nations ($i = 1, \dots, n$; $t = 1, \dots, t$).

3.5 Measuring Trade Blocs

The study measures African trade Blocs (TB_{sijt-1}) using the import and export linkages $W_{ij,t-1}^{trade}$. This intuition is embedded in the study by Viner's Theory of Trade Creation and Trade diversion theory; developed by Jacob Viner in 1950, which explores the effects of RTAs on trade patterns, where trade agreements can lead to increased trade volume among the countries that engage in RTAs due to lower tariffs and reduction in other trade barriers, as member countries import and export goods and services between themselves of which they were not able to do previously. Dees, di Mauro, Pesaran, and Smith (2007) assert that the measurement of trade blocs sheds light on inter trade between nations j and i . Scaled by the entire percentage of nation I 's exports and imports flows to and from different TBs, compiled as the total of nation I 's import flow from country J at time $t-1$ and the country I 's total exports flow to country J at time $t-1$. In other words, the formula below can be written as the total flow of trade between the two countries that trades together, divided by the countries' overall trade share in the TBs.

$$W_{i,j,t-1}^{trade} = \frac{exp_{ijt-1} + imp_{ijt-1}}{tot\ exp_{it-1} + tot\ imp_{it-1}} \quad (3.8)$$

Where $W_{i,j,t-1}^{trade} = TB_{sijt-1}$

To capture the effect of proximity in equation (3.8), we incorporate distance represented by “D” ($Dist_{ijt}$) to cater for the distance between countries involved in bilateral trade, thereby Modifying Equation (3.8) by multiplying it with the distances as demonstrated below:

$$\text{Where } W_{i,j,t-1}^{trade} = (TB_{sijt-1} * Dist_{ijt})$$

$$W_{i,j,t-1}^{trade} = \frac{exp_{ijt-1} + imp_{ijt-1}}{tot\ exp_{it-1} + tot\ imp_{it-1}} * Dist_{ijt} \quad (3.9)$$

Equation (3.9) provides a modified trade linkage with the introduction of “Distance” for the 53 African nations that trade regionally. The trade distance of countries j and i is represented

by *Distijt*. Thus, the "trade weighted distance" of nations that trade with one another on the continent is another name for the modified equation in (3.9). The distance is calculated using the proximities of the capital cities of the nations that engage in inter trade. This is necessary because the capital cities serve as a representation of the cities connected to the rest of the nation and the trade partner, and as such, they can facilitate and capture export and import related transactions. Transportation costs associated with bilateral trade flows between the exporting country (i) and the importing country (j) are also considered by the Distance (*Distij*) variable. Ngepah and Udeagha (2018) found transportation costs; (*Distij*), to be negatively correlated with bilateral trade flows and positively correlated with a nation's import and export sizes, which are proxied by the nation's GDPs, respectively. This suggests that trade shares between two nations that trade together may be impacted by distance. This further demonstrates that the trade flow decreases as two trading partners live farther apart from each other. It also clarifies that while shorter distances indicate reduced transportation costs, longer distances tends to incur much higher transportation cost.

Our assessment and the necessity of equations (3.8) and (3.9) are significant because they address the question of which countries trade with whom? and reflects on the bilateral features of trade flows between one African country and another African country.

Thus, we use the GMM estimation to specify our equation (3.10):

$$\begin{aligned}
\Delta \ln POV_{i,t} &= \alpha_0 + \alpha_1 \Delta \ln POV_{it-1} + \varphi \Delta \ln TB_{Sijt-1} + \beta \Delta \ln GINI_{it} + \lambda \Delta \ln GDPPC_{it} + \alpha_2 \Delta \ln Dist_{ijt} + \vartheta \Delta \ln CONTG_{ijt} \\
&+ \eta \Delta \ln REM_{it} + \pi \Delta \ln INF_{it} + \xi \Delta \ln IMPORT + \wedge \Delta \ln EXPORT + \theta \Delta \ln POPN_{it} + \delta \Delta \ln LIT_{it} \\
&+ \psi \Delta \ln HEA_{it} + \gamma \Delta \ln INST_{it} + \omega \Delta \ln FIN_{it} + \Delta \mu_i \\
&+ \Delta \varepsilon_{it}
\end{aligned} \tag{3.10}$$

For our 2nd question, and to identify relationship between TBs and contiguity ((*Bsijt* *

CONTGit), where we examine the impact of TBs on poverty reduction among African countries that share borders. Equation (3.11) provides the solution to the question as represented below:

$$\begin{aligned}
& \Delta \ln POV_{i,t} \\
& = \alpha_0 + \alpha_1 \Delta \ln POV_{it-1} + \varphi \Delta \ln TB_{sijt-1} + \Omega \Delta (TB_{sijt} * CONTG_{ijt}) + \beta \Delta \ln GINI_{it} + \\
& \lambda \Delta \ln GDPPC_{it} \\
& + \alpha_2 \ln Dist_{ijt} + \vartheta \Delta \ln CONTG_{ijt} + \eta \Delta \ln REM_{it} + \pi \Delta \ln INF_{it} + \xi \Delta \ln IMPORT \\
& + \Delta \ln EXPORT \\
& + \theta \Delta \ln POPN_{it} + \delta \Delta \ln LIT_{it} + \psi \Delta \ln HEA_{it} + \gamma \Delta \ln INST_{it} + \omega \Delta \ln FIN_{it} + \Delta \mu_i \\
& + \Delta \epsilon_{it}
\end{aligned} \tag{3.11}$$

Our Estimation (3.11) captures the proximity of trading partners, as TBs will have an impact on the reduction of poverty in nations that share borders. Thus; j denotes one partner nation and i denotes the other partners; φ , which is also shown in 3.4, 3.5, 3.6, 3.10, and 3.11, respectively, represents parameter vectors; and $\mathbf{W}$, which is shown in 3.8 and 3.9, denotes weights. The importance of TBs in reducing poverty is further demonstrated by the relevance of φ in the estimation. This aims to demonstrate that TBs proxies possess data that can identify the effects of bilateral trade flows between nations that engage in trade with one another and the possible overall influence on the entire African economies.

One of the many advantages of this research is that it will enable African economies to assess the extent to which bilateral trade flows can affect their economies. This is because the study will capture the actual scope and magnitude of bilateral trade flows, with the potential to indicate the impact of proximities in bilateral trade. The various aspects of TBs and the advantages enjoyed by trading nations will be equally taken into consideration, and the genuine impact of TBs on the economic development of trading nations, as well as its impact on reduction of poverty in Africa will also be considered.

To answer our first research question, the following are summaries of the functional forms that were utilized to analyse the empirical framework on the influence of TBs on poverty reduction in the 53 developing nations in Africa that were sampled using OLS, RE, and GMM, subsequently:

$$\ln POV_{i,t} = \alpha_i + \varphi \ln TB_{sijt} + \beta \ln GINI_{it} + \lambda \ln GDPPC_{it} + \alpha_2 \ln Dist_{ijt} + \vartheta \ln CONTG_{ijt}$$

$$\begin{aligned}
& + \eta \ln REM_{it} + \pi \ln INF_{it} + \xi \ln IMPORT + \lambda \ln EXPORT + \theta \ln POPN_{it} + \delta \ln LIT_{it} + \psi \ln HEA_{it} \\
& + \gamma \ln INST_{it} + \omega \ln FIN_{it} + \mu_i \\
& + \varepsilon_{it}
\end{aligned} \tag{3.12}$$

$$\begin{aligned}
& \Delta \ln POV_{i,t} \\
& = \alpha_0 + \alpha_1 \Delta \ln POV_{it-1} + \varphi \Delta \ln CBT_{ijt-1} + \beta \Delta \ln GINI_{it} + \lambda \Delta \ln GDPPC_{it} + \alpha_2 \Delta \ln Dist_{ijt} + \vartheta \Delta \ln CONTG_{ijt} \\
& + \eta \Delta \ln REM_{it} + \pi \Delta \ln INF_{it} + \xi \Delta \ln IMPORT + \lambda \Delta \ln EXPORT + \theta \Delta \ln POPN_{it} + \delta \Delta \ln LIT_{it} + \\
& \psi \Delta \ln HEA_{it} + \gamma \Delta \ln INST_{it} + \omega \Delta \ln FIN_{it} + \Delta \mu_i \\
& + \varepsilon_{it}
\end{aligned} \tag{3.13}$$

Additionally, we include proximity, or $(TBS_{ijt} * CONTG_{it})$, in each equation to address our second research topic. The reason is to allow us to examine the influence of TBs on poverty reduction in African nations that share borders while considering the potential effects of contiguity. Additionally, we calculated this using pooled OLS, RE, and System GMM, as shown below:

$$\begin{aligned}
\ln POV_i = & \alpha_0 + \varphi \ln TBS_{ijt} + \Omega(TBS_{ijt} * CONTG_{ijt}) + \beta \ln GINI_{it} + \lambda \ln GDPPC_{it} + \alpha_2 \ln Dist_{ijt} \\
& + \vartheta \ln CONTG_{it} + \eta \ln REM_{it} + \pi \ln INF_{it} + \xi \ln IMPORT + \lambda \ln EXPORT + \\
& \theta \ln POPN_{it} \\
& + \delta \ln LIT_{it} + \psi \ln HEA_{it} + \gamma \ln INST_{it} + \omega \ln FIN_{it} + \mu_i \\
& + \varepsilon_{it}
\end{aligned} \tag{3.14}$$

$$\ln POV_i = \alpha_i + \varphi \ln TBS_{ijt} + \Omega(TBS_{ijt} * CONTG_{ijt}) + \beta \ln GINI_{it} + \lambda \ln GDPPC_{it} + \alpha_2 \ln Dist_{ijt}$$

$$\begin{aligned}
& + \vartheta \ln CONTG_{it} + \eta \ln REM_{it} + \pi \ln INF_{it} + \xi \ln IMPORT + \lambda \ln EXPORT + \\
& \theta \ln POPN_{it} \\
& + \delta \ln LIT_{it} + \psi \ln HEA_{it} + \gamma \ln INST_{it} + \omega \ln FIN_{it} + \mu_i \\
& + \varepsilon_{it}
\end{aligned} \tag{3.15}$$

Also, to effect λ_i . Equation (3.4) will therefore be changed to: $POV_{it} = \alpha_0 + \alpha POV_{it-1} + \beta X_{it} + \lambda_i + U_{it}$ (3.16)

Thereby removing the country-specific effects in the estimation using first difference in equation 3.17

$$\begin{aligned}
& \ln POV_{it} - \ln POV_{i,t-1} = \alpha_0 + \alpha (\ln POV_{it-1} - \ln POV_{i,t-2}) + \beta (X_{it} - X_{i,t-1}) + \\
& (U_{it} - U_{i,t-1}) + (\lambda_{it} - \lambda_{i,t-1})
\end{aligned} \tag{3.17}$$

According to the equation above, the unobserved error term $(i, -i, -1)$ correlates with lagged variable $\ln POV_{it} - \ln POV_{i,t-1}$; this indicates that the first difference's performance yields subpar results due to the lagged level of data, making it a biased estimator. The GMM estimator also offers the benefit of an existing built in method of managing heterogeneity in analysis that involves panel data, making it efficient and consistent to use.

However, two hypotheses are used to maintain GMM estimator's reliability. Therefore, our explanatory variables must be uncorrelated with the error terms for the first hypothesis to be correct. Roodman, (2009). It follows that in a poverty regression, the lagged values of the explanatory variables must be a reliable tool. Thus, the Sargan test of over identifying restrictions is used to test our hypothesis further. However, should we detect first-order negative autocorrelation, then AR1 & 2 will be used to test for zero second-order autocorrelation

This implies that instrumental variables are not linked to the residual and as such, satisfy the required orthogonality criteria if the null hypothesis is not rejected. Therefore, to show that errors are not revealed in the second-order correlation, a serial correlation test is also conducted.

3.6 Variables with their sources

This study makes use of a set of annual panel dataset for 53 African countries spanning 1995 - 2023. The African countries sampled in the study are shown in Table 2. The data used in our analysis are sourced from World Development Indicators (WDI), the United Nations Conference on Trade and Development (UNCTAD), the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII) database and the POVCALNET of the World Bank. The African countries used in the study, including the chosen time frame, were limited by data availability. The in-depth description of the data used in the study is discussed below:

To measure various income levels within an economy in order to detect the impact of TBs, we estimated poverty using the poverty headcount ratio and poverty gap. The poverty headcount ratio indicates the percentage of people living below the United Nations (2020) income line of \$2.15 per day. On the other hand, the poverty gap, which assesses the mean income level of those living below the poverty line, is an acronym for robustness check. These dependent variables are linked to data from the World Bank's POVCALNET, as shown in Table 1. While the rest of our data came from UNCTAD, WDI, and the Centre d'Etudes Prospectives et d'Informations Internationales (CEPII).

TBs, our main independent variable is analysed using the trade flows from bilateral trade between countries in a trade Bloc, recognising the distance between the countries that trade together. The variables used in measuring the TBs are bilateral import and export, total import and export as a percentage of the GDP and the proximity of the bilateral trade. The Trade Blocs variables are also obtained from UNCTAD and World Development Index, while the geographical proximity is retrieved from CEPII databases.

Our control variables include: inflation which stands for macroeconomic stability, government expenditure on education and health, GDP per capita, international remittances, financial development, size of the population and institutions within a country. The data for these variables are from WDI, whereas the POVCALNE is the data source for income disparity as determined by the Gini coefficient, displayed in Table 1 as shown below:

Table 1: Variables and their Data Sources

Variable (Dependent)	Proxy	Explanation	Data Sources
Poverty head count	HEAD COUNT	The % of individuals living below poverty line	POVCALNET
Poverty gap	POVGAP	Mean derivation relative to poverty line	POVCALNET
Independent Variables	Proxy	Explanation	Data sources
Gini coefficient	INEit	Measures inequality from 0 to 10. With 0=perfect equality and 10. High inequality	POVCALNET
Bilateral export	Expijt	Export from country i to j	UNCTAD
Bilateral import	Impijt	Import from country j to i	UNCTAD
Export as % GDP	tot expit	Total export as % of GDP	WDI
Import as % GDP	tot impit	Total import as % of GDP	WDI
Distance	Distijt	Proximity of the two trading Partner	WDI
Per capita GDP	GDPPCit	GDP per capita in US dollars	CEFI
Closer border	CONTIGijt	Geographical Border between the trading partners	WDI
Inflation	INFit	Change in annual price level	CEFI
Literacy rate	LITit	Annual % school enrolment at secondary school level	WDI
Expenditure by government on Health	HEAit	Government expenditure on health as a percentage of GDP calculated annually	WDI

Population	POPit	Population growth rate of the trade partners	WDI
Institution and Governance	INSTit	The level of the public sector's transparency, accountability, governance or corruption level	WDI
Domestic credit	FINit	Level of available credit to citizens	WDI

Computed by the Author

The 53 countries sampled in the study are displayed in Table 2 as shown below:

Table: 2: African countries displayed within their Trade Blocs as used in study

SACU MEMBERS	SADC MEMBERS	EAC MEMBERS	AMU MEMBERS	ECCAS MEMBERS	ECOWAS MEMBERS	COMESA MEMBERS
BOTSWANA	ANGOLA	BURUNDI	ALGERIA	ANGOLA	BENIN	BURUNDI
ESWATINI	BOTSWANA	DEMOCRATIC REPUBLIC OF CONGO	LIBYA	BURUNDI	BURKINA FASO	COMOROS
LESOTHO	COMOROS	KENYA	MAURITANIA	CAMEROON	CABO VERDE	DRC CONGO
NAMIBIA	REPUBLIC OF CONGO	RWANDA	MOROCCO	CENTRAL AFRICAN REPUBLIC	COTE D'IVOIRE	DJIBOUTI
SOUTH AFRICA	ESWATINI	SOMALIA	TUNISIA	CHAD	GAMBIA	EGYPT
	LESOTHO	SOUTH SUDAN		DRC CONGO	GHANA	ERITRIA
	MADAGASCAR	TANZANIA		EQUATORIAL GUINEA	GUINEA	ESWATINI
	MALAWI	UGANDA		GABON	GUINEA BISSAU	ETHIOPIA
	MAURITIUS			RWANDA	LIBERIA	KENYA
	MOZAMBIQUE			REPUBLIC OF CONGO	MALI	LIBYA
	NAMIBIA			SAO TOME	NIGER	MADAGASCAR

	SECHELLES				NIGERIA	MALAWI
	SOUTH AFRICA				SENEGAL	MAURITIUS
	TANZANIA				SIERRA LEONE	RWANDA
	ZAMBIA				TOGO	SEYCHELLE S
	ZIMBABWE					SOMALIA
						SUDAN
						TUNISIA
						UGANDA
						ZAMBIA
						ZIMBABWE

Computed by the Author

Chapter 4: Empirical Results

Introduction

The chapter started with descriptive statistics in 4.1, followed by detailed pairwise correlation matrix analysis in section 4.2. The Sargan test is conducted in Section 4.3 with the estimation result in Section 4.3. The last section discusses the GMM estimations with the resultant outcome and conclusions.

4.1 Descriptive statistics

Examining the distribution of our data is crucial before moving forward with an empirical evaluation of whether TBs have helped to reduce poverty in Africa and whether the presence of TBs and the proximity of trading nations have an effect on poverty reduction within the 53 sampled countries. Our dependent variables are Poverty Headcount (POVHC) and Poverty Gap (POVGAP), while our explanatory variables are Gini-index, Bilateral Import, Bilateral export, Distance, Contiguity, GDPPC, Total imports, Total exports, Remittance, Inflation, Secondary school enrolment, Population growth, Government health expenditure, Institutions, and Domestic credit.

The summary statistics of all our variables are shown in Table 3 below:

Table 3: Summary statistics

Variable	Obs.	Mean value.	Min	Max	Standard dev	Variance	Skewness	Kurtosis
Povert_HC	66,250	35.655	0	94.06	26.294	691.356	0.1021	1.7740
Poverty_Gap	66,300	14.696	0	78.77	13.35994	178.487	0.8329	3.1036
Gini_index	66,200	14.412	0	65.76	20.79087	432.260	0.8602	1.9859
BIIMPORTT	66,272	10808.89	1	36951	12202.28	1.49e+08	0.6983	2.0133
BIEXPORTT	66,286	8659.528	1	33279	10826.78	1.17e+08	0.8733	2.2779
CBT	66,258	2261296	0.32543	2.21e+08	1.19e+07	1.42e+14	7.3919	69.492
DistW	66,300	3662.858	162.182	9772.06	1893.739	358625	0.3641	2.5113
IMPORTT	66,300	515.854	1	1169	368.7801	135999	0.0989	1.7193
EXPORTT	66,300	515.854	1	1169	368.7801	135998.8	0.0988	1.7193
Gdppc	66,300	628.194	1	1291	382.7015	146461	0.0064	1.7892
Remm	66,300	482.263	1	1101	335.9072	112399	0.1386	1.8354
Inff	66,300	608.2119	1	1262	370.1495	137011	0.0821	1.7438
Secschenroll	66,300	200.569	1	728	238.6713	56964	0.7914	2.1416
Popn	66,300	655.527	1	1318	382.7394	146489	0.0004	1.7994
Healthexp	66,300	329.590	1	934	310.6808	965226	0.4183	1.7437
Ins,t	66,300	7.082	1	26	7.545955	56.941	0.7056	1.9413
Domcreditt	66,300	589.707	1	1250	379.2351	143819	0.0280	1.7694

Authors computation

The summary statistics indicate a considerable degree of diversity among the 53 nations we selected, with the mean poverty level being 36% and the inequality level, as determined by POVHC, being 14.0%. The poverty gap level of 15.0% comes next. The average value of the Gini coefficient is 14.412. all of which were measured over a year period. For POV HC, the corresponding kurtosis and skewness values are 0.1021 and 1.7740, respectively. The kurtosis value is platykurtic because $1.7740 < 3$, and poverty headcount has a skewness that is normal at 0.1021, indicating that our sample's distribution is symmetrical around the mean. This demonstrates a flattened curve resulting from lower values that are below the sample average. Kurtosis must be mesokurtic, or have a value of at least 3, to be considered regularly distributed. POV GAP's values are 0.8329 and 03.1036, suggesting that it has a high degree of

kurtosis with a kurtosis value of 03.104 and are positively skewed at 0.8329. The Gini coefficient's skewness and kurtosis value indicate a little positive Gini; skewed, and positive platykurtic with a kurtosis value of less < 3 . These values are 0.8600 and 1.9859, respectively. Annual average value of export and import trade for the 53 sampled countries of Africa in import amounted to US\$10,808.89 million, while that of exports equals US\$8.659.528 million over the period 1995 to 2023. And as such indicated that they had more flow of bilateral export less than import in Africa, while the export growth as a percentage of GDP and import value with the mean value of 515.854, same for all trade shares. The average value of inter border trade is 226.129. The sampled countries are separated by an average distance of 3662.858 km. With average GDPPC at \$628.194 in US dollars. Average population growth rate was 655.527. The other variables had mean values of 482.738, 0.0596087 for remittance, 608.212, for inflation, 329.591 for literacy, 7.082 for government spending on health, 7.546 for institutions, and 589.707 for FIN, which is proxied by domestic credit to the private sector.

4.2 Pairwise correlation

Based on our theoretical presumptions, the pair wise correlation is mostly employed to characterise the relationships between variables. All of the explanatory variables that explains the causes of poverty in the study are displayed along with their theoretical expected signs. From our pair wise correlation, there is a correlation between the variables under consideration, as indicated by the correlation coefficients of the variables being greater than zero. Table 4 illustrates the negative and substantial link between our poverty factors; whereby Bilateral imports, bilateral exports, Total import, total export, CBT, and distance have a negative relationship with the two measures of poverty, suggesting that bilateral trade between the 53 African countries employed in the study is associated with poverty reduction, it further indicates that the poor are more prone to trade to improve their financial circumstances. CBT also; shows a negative correlation with our poverty variables at 10% level, which also indicates that proximity between countries that trade together might contribute to poverty reduction.

Inequality tends to increase poverty, which conforms with our theory, as inequality reduces the chances of the poor getting out of poverty and as such causes poverty to rise. Among our indicators of poverty: total imports and exports as a percentage of GDP have a negative correlation with poverty, which also conforms to our theory, except for imports. Also, remittances, expenditures of government on health, financial development and literacy rates have a negative correlation with both of the poverty measures, indicating that they all help to reduce poverty. On the other hand, inflation has a positive correlation with the dependent variables, indicating that rising price levels may increase the poverty rate, which aligns with our theory as rising prices tend to reduce the purchasing power of consumers. The overall pair-wise findings are all theoretically expected and moderately correlated at 10% level.

Conversely, the real GDP per capita has a positive relationship with the measures of poverty, suggesting that income growth may increase poverty. This does not reflect the convergence effect predicted by the conditional convergence hypothesis; hence, the coefficient is expected to be negative and poverty reducing.

Additionally, population and poverty measures have a negative correlation, suggesting that population growth may not necessarily result in poverty, defying our theoretical prediction, as an increase in population growth reduces access to scarce resources. Institutions are positively correlated with poverty, which may be because most of the nations in our sample lack excellent governance and high-quality institutions, which should boost economic growth and, therefore, may not reduce poverty. However, our measures of poverty show a strong correlation with proximity, with a positive and substantial correlation with the measures of poverty, indicating that it does not alleviate poverty.

Furthermore, the pair wise correlation showcased that the Trade Blocs of SADC, AMU and COMESA are negatively correlated with poverty measures, indicating that trade flows from these Trade Blocs reduces poverty, while Trade Blocs: SACU, EAC, ECCAS and ECOWAS are positively correlated with our poverty measures, suggesting that trade flows from these countries does not reduce poverty.

However, SADC, SACU, EAC, AMU, ECOWAS, and COMESA are all correlated with bilateral export and import at 10% level, except for ECCAS, which is negatively correlated with Bilateral import, indicating that belonging to these Trade Blocs is related to reduced bilateral trade flows, contrary to our theoretical expectations. But because of the 10% significance level, the result further suggests that the trade flows might improve over time.

Table 4: Pairwise correlation

	lnPVHC	lnPVGap	lnGini	lnBIIM~T	lnBIEX~T	lnCBT	lnDistW
lnPVHC	1.0000						
lnPVGap	0.9898*	1.0000					
lnGini	0.2968*	0.2803*	1.0000				
lnBIIMPORTT	-0.0763*	-0.0837*	-0.0458*	1.0000			
lnBIEXPORTT	-0.0992*	-0.1131*	-0.0334*	0.5282*	1.0000		
lnCBT	-0.0728*	-0.0870*	-0.0944*	0.8266*	0.8186*	1.0000	
lnDistW	-0.1786*	-0.1753*	-0.0305*	-0.2255*	-0.2619*	-0.1561*	1.0000
Contig	0.0402*	0.0389*	-0.0406*	0.1589*	0.1796*	0.1224*	-0.4539*
lnGdppc	0.0143*	0.0135*	0.0474*	0.0907*	0.0792*	-0.0228*	-0.0069*
lnIMPORTT	-0.2269*	-0.2188*	0.0195*	0.1401*	0.1382*	-0.1691*	0.0279*
lnEXPORTT	-0.1655*	-0.1630*	0.0471*	0.1350*	0.1497*	-0.1565*	0.0253*
lnPopnn	-0.0384*	-0.0301*	0.1020*	0.0136*	-0.0125*	-0.0069*	0.0070*
lnRemm	-0.0797*	-0.0971*	-0.0961*	0.1377*	0.1258*	0.1216*	0.0293*
lnInff	0.0833*	0.0701*	0.0711*	0.0852*	0.0852*	0.0837*	0.0009
lnSecschen~l	-0.2405*	-0.2491*	-0.0867*	0.0626*	0.0592*	0.0665*	0.0623*
lnhealthexpp	-0.0918*	-0.0937*	-0.0375*	0.1226*	0.0965*	0.1033*	0.0111*
lnInstt	0.2677*	0.2465*	-0.0559*	0.0909*	0.0381*	0.0787*	-0.0734*
lnDomcreditt	-0.1492*	-0.1419*	0.2002*	0.0755*	0.0526*	-0.0016	0.0190*
CBTContig	0.0535*	0.0517*	-0.0505*	0.1833*	0.2077*	0.1746*	-0.4252*
SADC	-0.0115*	0.0029	0.1747*	0.1429*	0.1471*	0.0958*	-0.2282*
SACU	0.0108*	0.0140*	0.1120*	0.0656*	0.0602*	0.0271*	-0.1776*
EAC	0.0696*	0.0677*	-0.0310*	0.0530*	0.0670*	0.0629*	-0.1849*
AMU	-0.1817*	-0.1788*	-0.0847*	0.0580*	0.0598*	0.0421*	-0.0290*
ECCAS	0.0665*	0.0697*	0.0560*	-0.0135*	0.0016	-0.0265*	-0.2772*
ECOWAS	0.1141*	0.1075*	-0.1046*	0.1212*	0.1272*	0.0680*	-0.4613*
COMESA	-0.0783*	-0.0818*	0.0086	0.0501*	0.0607*	0.0548*	-0.1486*

*Authors' computation**at the 10% level*

Preliminarily, TBs among African countries are associated with a moderate level of poverty reduction. However, due to the endogeneity problem, pair-wise correlations are unable to provide us with causation evidence. As a result, it might not have reflected the true signs and magnitude of the relationship. Therefore, our variables will be re-evaluated using a scientific estimation technique in the next section.

4.3 Sargan Test and result of heteroscedasticity

To ensure the robustness and validity of our results, we conducted a model specification test using the Sargan test. The Sargan Hansen test is used to validate the specification of a model. It is also used for robustness check of the findings. It is employed primarily in GMM to validate over-identifying constraints and also to assess the validity of our instrumental variables.

As a result, we formulated the following new hypothesis:

H₀: Excessive identification of limitations is not valid

H₁: Excessive identification of limitations is valid

Under the Headcount measure which is our primary poverty variable, the test's estimation indicates that the Sargan test for both TBs and TBs proximity is > 0.05 . That means that the null hypothesis could not be rejected as it validates our model for overidentifying instruments, as shown in Table 6.

4.4 Estimation Result

Table 5: OLS, Fe and RE

	<i>Model 1</i>	<i>Model 2</i>	<i>Model 3</i>	<i>Model 4</i>	<i>Model 5</i>	<i>Model 6</i>
<i>ESTIMATOR</i>	<i>OLS</i>	<i>OLS</i>	<i>RE</i>	<i>RE</i>	<i>FE</i>	<i>FE</i>
<i>Main Variable</i>	<i>Poverty (TBs)</i>	<i>Contiguity</i>	<i>Poverty (TBs)</i>	<i>Contiguity</i>	<i>Poverty (TBs)</i>	<i>Contiguity</i>
Ln (CBT)	-0.0256*** (0.000)	-0.0264*** (0.000)	0.009*** (0.000)	-0.0086*** (0.000)	-0.0055*** (0.000)	-0.026*** (0.000)
Ln (Gini)	3.013*** (0.000)	3.0124*** (0.000)	3.727*** (0.000)	3.726*** (0.000)	4.017*** (0.000)	4.016*** (0.000)
Ln (Gdppc)	0.164*** (0.000)	0.1643*** (0.000)	0.025*** (0.000)	0.025*** (0.000)	0.022*** (0.000)	0.022*** (0.000)
Ln (DistW)	-3.354*** (0.000)	-0.3571*** (0.000)	0.409*** (0.000)	-0.410*** (0.000)	Omitted	Omitted
Contig	0.100*** (0.002)	-0.3578*** (0.000)	0.191* (0.039)	-0.2146*** (0.002)	Omitted	Omitted
CBTContig	_____	0.0266*** (0.000)	_____	0.013*** 0.006	_____	0.09*** 0.029
ln Rem	-0.059*** (0.000)	-0.0596*** (0.000)	0.031*** (0.000)	0.031*** (0.000)	0.039*** (0.000)	0.039*** (0.000)
ln lnf	0.1019*** (0.000)	0.1019*** (0.0000)	0.0027*** (0.000)	0.0272*** (0.000)	0.0019*** (0.000)	0.0019*** (0.000)
ln import	0.07019*** (0.000)	0.069*** (0.000)	0.0123*** (0.000)	0.0123*** (0.000)	0.0119*** (0.000)	0.0119*** (0.000)

Ln export	-0.01321*** (0.000)	-0.1307*** (0.000)	0.0007 (0.151)	0.0007 (0.114)	0.0027*** (0.000)	0.0028*** (0.000)
Ln pop	0.0199*** (0.049)	0.0197*** (0.052)	0.099*** (0.000)	0.099*** (0.000)	0.120*** (0.000)	0.120 *** (0.000)
Ln lit	-0.0254*** (0.000)	-0.0254*** (0.000)	0.008*** (0.000)	0.008*** (0.000)	0.009*** (0.000)	0.009*** (0.000)
Ln healthexp	-0.0523*** (0.000)	-0.0524*** (0.000)	0.023*** (0.000)	0.023*** (0.000)	0.020*** (0.000)	0.020*** (0.000)
Ln Inst	0.446*** (0.000)	0.4463*** (0.000)	0.093*** (0.000)	0.093*** (0.000)	0.129 (0.000)	0.129*** (0.000)
Ln Domcredit	-0.15719*** (0.000)	0.1581*** (0.000)	0.054*** (0.000)	0.055*** (0.000)	0.039*** (0.000)	0.039*** (0.000)
SADC	-0.4484*** (0.000)	-0.4484*** (0.000)	8.25*** (0.000)	8.26*** (0.000)	Omitted	Omitted
SACU	-0.2851*** (0.000)	-0.2892*** (0.000)	3.99*** (0.000)	3.98*** (0.000)	Omitted	Omitted
EAC	0.7238 (0.000)	0.7102 (0.000)	5.85 (0.000)	5.85 (0.000)	Omitted	Omitted
AMU	-1.827*** (0.000)	-1.8294*** (0.000)	11.87*** (0.000)	11.88*** (0.000)	Omitted	Omitted
ECCAS	-0.0448*** (0.222)	-0.0422*** (0.243)	0.53*** (0.594)	0.54*** (0.594)	Omitted	Omitted
ECOWAS	0.1847 (0.000)	0.1835 (0.000)	3.47 (0.001)	3.46 (0.001)	Omitted	Omitted
COMESA	-0.3847*** (0.000)	-0.3858*** (0.000)	5.82*** (0.000)	5.83*** (0.000)	Omitted	Omitted
Nos of Observations	20386	20386	20386	20386	20386	20386
R Squared	0.3950	0.3952	0.3556	0.3557	0.3610	0.3612
No of Paired	---	---	2.300	2.300	2.300	2.300
Hausman test	----	----	Prob > chi squared =0.000	Prob > chi squared =0.000	Prob > F =0.000	Prob > F=0.000

Author's computation

The analysis in Table 5 reports the results of pooled OLS, RE, and FE, while Table 6 presents the results of the GMM estimate technique. The objective of the study is firstly to investigate whether TBs affects poverty reduction in Africa by utilising the dataset from 53 African countries in the study; and secondly to establish whether TB between countries that share geographical border(s) reduces poverty by considering the interaction term effect of the two variables of interest, i.e., TB and Contiguity. Our first research question is addressed by the estimation outcome shown in our Table 5's Columns 1, 3 and 5, while our second research question is addressed by the interactive term found in Columns 2, 4 and 6. These models results serve as a benchmark for our analysis. As theoretically expected, the coefficient of TBs, which is our primary independent variable, consistently stays negative at 1% level across all estimated models. Keeping with our first research question, the results show that a 1% increase in bilateral trade between nations that trade in Africa is linked to a 0.030%, 0.009%, and 0.006% decrease in poverty, respectively. These results are all significant at 1% level, suggesting that the effect may hold over time.

For our research question 2, the OLS results show that a 1% increase in the interaction among countries that trade together with closer proximity leads to a 0.0013% and 0.0090% rise in the incidence of poverty level, respectively. The estimated coefficients for our sampled trade Blocs are negative under OLS for SADC, SACU, AMU, ECCAS, and COMESA and are statistically significant at less than a 0.05 percent level, indicating that regional trade among these Blocs reduces poverty. The outcome is theoretically expected and tallies with Heckscher-Ohlin theory of trade. Conversely, the estimated coefficient in EAC and ECOWAS under OLS shows a positive relationship suggesting that Trade in these Blocs might be increasing poverty. It is worth noting that the variables are statistically significant as they are all statistically significant at less than 0.05% level.

Although OLS estimation technique is generally used to estimate trade effects, (Westerlund & Wilhelmsson, 2011). However, there are problem associated with OLS estimator's biasness in samples with unobserved endogeneity, together with the removal of zero trade flow, which might have contributed to inefficient coefficients that might have yielded the contradictory results, thus inadequate in addressing multicollinearity issues;, as explained by Martin and Pham, (2008). In other to cater for these issues, we further employed the RE and FE estimation. The result then yielded significant results where the TBs' results for research questions 1 and 2 became consistent with a positive correlation across the board with all our

explanatory variables reversing the expected results. This suggests that growth from trade may not be directly linked with poverty reduction in Africa. Although the outcome goes against our theoretical expectations and is incompatible with the convergence theory, the nature of their significances suggests that the outcome may change over time.

As explained in our theory, RE is seen to be more suitable and beneficial than FE in the study because it accommodates and provides estimates for those independent variables that are time constant, as shown in Table 5. Such explanatory variables include distance, contiguity (i.e., a common border), common language, race, and gender, which were previously omitted during FE estimation (Udeagha, 2018). Notwithstanding the advantages of RE over FE in the study, RE also has some drawbacks, as it can result in biased and inconsistent estimates, which are the primary econometric issues in; trade and poverty studies.

To solve these possible endogeneity issues explained above, this study relies on and will be justified mainly by the GMM results. The reason is that GMM is known to control for heterogeneity and endogeneity issues, thereby mitigating the omitted variable bias problem that might have existed in the baseline models. Therefore, the study will draw its inference and policy implications base on the GMM results.

4.5 GMM

GMM estimation technique is employed to estimate the empirical findings given in Table 6. The results of the four empirical sub-models provided is estimated using the GMM estimation technique developed by Blundell and Bond (1998). The benchmark of the model is focussed on the poverty framework proposed by Ravallion and Chen (1997), which also draws insight from other studies such as Capistrano and Maria (2007).

Table 6: GMM

MODELS:	1	2	3	4
<i>Variables</i>	<i>TBs & Poverty Head count (Incidence)</i>	<i>Contiguity & poverty head count (Incidence)</i>	<i>TBs & Poverty Gap (Intensity)</i>	<i>Contiguity & Poverty Gap (Intensity)</i>
LN(POV) (-1)	0.6582*** (0.000)	0.6447285*** (0.000)	0.6332577*** (0.000)	0.6237673*** (0.000)
LnCBT	-0.0105667 (0.226)	-0.0079924*** (0.390)	-0.0445164 (0.000)	-0.0422801 (0.000)

Ln (Gini)	3.286628*** (0.000)	3.375181** (0.000)	-0.43468141*** (0.000)	-0.4319056*** (0.000)
CBTContig	-----	0.151815 (0.055)	-----	0.1888505 (0.018)
Ln (Gdppc)	-0.0242711*** (0.000)	-0.0247408*** (0.000)	-0.0496196** (0.000)	-0.051583** (0.000)
Ln (DistW)	-2.02665*** (0.351)	-2.112042*** (0.319)	-4.035058*** (0.000)	-3.934422*** (0.000)
Contig	11.19194** (0.203)	9.098207* (0.309)	1.487064 (0.700)	-0.4829277 (0.896)
Ln Rem	-0.0169226*** (0.006)	-0.0165085*** (0.010)	-0.0092061*** (0.211)	-0.0108771*** (0.158)
Ln Inf	-0.00753*** (0.078)	-0.0068323 (0.099)	-0.0142012*** (0.000)	-0.0140809*** (0.000)
Ln import	0.0472005** (0.000)	0.0446041** (0.000)	0.0963242*** (0.000)	0.0943938*** (0.000)
Ln export	-0.0256643*** (0.010)	-0.0145871 (0.286)	-0.042251*** (0.000)	-0.0262217*** (0.012)
Ln pop	-0.0065 (0.856)	-0.0038297 (0.826)	0.0132591(0.365)	0.016966 (0.255)
Ln lit	-0.0065755 (0.035)	0.0070281 (0.021)	-0.0059304*** (0.016)	-0.0064679*** (0.011)
Ln healthexp	0.002011 (0.276)	0.0010716 (0.550)	0.0065114*** (0.000)	0.0047955*** (0.003)
Ln Inst	0.0203504 (0.604)	0.0221966 (0.571)	-0.0552423 (0.044)	-0.0525522 (0.056)
ln Domcredit	-0.0027615 (0.678)	-0.0037417 (0.554)	0.000495 (0.991)	-0.0001322 (0.977)
SADC	2.159 (0.232)	2.355713 (0.181)	-0.153598 (0.923)	0.1733337 (0.913)
SACU	-5.605 (0.725)	-6.551903(0.673)	19.84992 (0.075)	19.32519 (0.082)
EAC	0.0562 (0.993)	0.6222014 (0.923)	3.852675 (0.331)	3.578361 (0.357)
AMU	9.8863 (0.307)	9.772589 (0.298)	-10.190157 (0,151)	-10.72046 (0.131)
ECCAS	1.61059 (0.797)	1.482225 (0.810)	-1.587837 (0.621)	-1.139359 (0.728)
ECOWAS	3.985593 (0.260)	4.056929 (0.247)	-4.099168 (0.065)	-3.727452 (0.096)
COMESA	0.6625117 (0.751)	0.5509622 (0.789)	-0.04956988 (0.660)	-0.5675253 (0.614)
Nos of Observations	19380	19329	19430	19379

Nos of Paired	F2300	02300	02300	2300
Instrument	2300/215	2300/190	2300/191	2300/191
P value	0.0525	0.0581	0.0973	0.0766
Sargan test	1.000	1.000	0.0000	0.0000

Author's computation

*** p<0.01; **P<0.05 and *P<0.1

The models include the lagged dependent variable of poverty, TBs, inequality, contiguity, distance and GDP per capita among the 53 African economies over time. Others are Inflation (control for macro-economic instability), total import, total export, remittances literacy (measures human capital), population growth, health expenditure (governmental social spending), institution (an indicator of institutional quality) and domestic credit (representing the level of financial development within the country) are included in the models and remain our explanatory variables.

Equation (3.10) and (3.11) in the previous section is constructed to answer our research questions 1 and 2, respectively, using GMM.

Column 1 shows estimate of the impact of TBs on poverty reduction in Africa, whereas Column 2 outlines the estimates of the combined effect of TBs and proximity on poverty, specifically for poverty incidence (i.e., POVHC). For robustness check, while following the same trail of Gnanon (2019), Column (3) and Column (4) estimated results show the poverty intensity aspect of research questions 1 and 2 (i.e., POVGAP for poverty intensity) respectively.

In table 6, none of the models suffers from second-order serial correlation. This implies that the null hypothesis of second-order serial autocorrelation is rejected for all the models i.e., from column (1) to column (4). In line with Saba and Ngepah, (2019) study, the Sargan Test for Over-Identifying Restrictions was used to confirm the validity of the GMM for the estimated models. Only the estimated results in column (1) and column (2) passed the Sargan test, as their p-values are insignificant. Hence the study accepted the null hypothesis and concluded that the over-identifying restrictions were valid, the model instruments are valid, and the model's power of properties are sufficient for policy making, and drawing inferences by using the results presented in column (1) and (2) which is the main and preferred poverty measure (i.e., poverty headcount ratio) in the study.

Across all the models, the coefficient of Trade Blocs reduces poverty. In Column (1) of Table 6, which answers our first research question using equation (10), the coefficient of CBT has a negative and significant effect on poverty reduction in Africa. According to the result, for every 1% increase in TBs, poverty declines by 0.010% under PVHC ratio in Africa (i.e., poverty incidence), and is statistically significant at 1% level. This result is confirmed with the robust results in Column (3), where a 1% increase in TBs leads to 0.044% decrease in the poverty gap (i.e., for poverty intensity). This suggests a remarkable improvement in the situation of the poor, as this leads to reduction in the number of poor people as well as in the poverty gap. This result aligns with the Stolper Samuelson theory which states that when an economy is involved in trade integration, there is an increase in real income through its abundant factors which substantially leads to poverty reduction (Krugman, Obstfeld and Melitz, 2015). This result aligns with our theories and findings of studies of (Le Goff and Singh 2014; Gnangnon 2019) but is not consistent with the results of Beck, Demirguc-Kunt, and Levine (2007) and Kpodar and Singh (2011) studies considering the outcome of the explanatory variables that stimulate reduction in the PVHC ratio and PVGAP in Column (1) and (3).

The estimated GDP per capita ($\ln Gdppc$) result shows a negative and statistically significant effect on poverty reduction in all the columns, which aligns with the convergence tendency. This result is confirmed under poverty intensity which is also negative and statistically significant. This is consistent with the theoretical literature which states that trade integration is a catalyst for economic development. (Smith 1776; Ricardo 1817; Helpman and Krugman 2009) which subsequently leads to poverty reduction as trade between countries stimulates poverty reduction through its growth impact on the sample countries, leading to increase in the development of domestic technology which enhances the production efficiency and output level, hence leading to poverty reduction (Nienaber and Wille, 2020). This outcome is supported by Dollar and Kraay (2002) study that growth is good for the poor, and so is likely for Africa. The coefficient of Distance ($DistW$) under both poverty incidence and intensity shows a negative and significant effect on poverty reduction. This explains that TBs in Africa does not increase poverty, hence tends to motivate the poor to engage more in trade. This is consistent with Anyanwu (2009) study which explains that increase in paved roads infrastructures in Africa facilitate trade and the movements of goods, thereby pushing the poor towards trade around Africa which then has the potential to reduce poverty emanating from gains from trade. As expected, the estimated coefficient of the total import increases poverty compared to total export coefficient that reduces poverty. This is theoretically

expected and consistent with the literature (Thomas 2002; Heo and Doanh 2009). This also suggests that the exports share has the potential to lower poverty, while the imports share contributes to poverty as fewer local human resources are used. This indicates that countries should pay more attention in improving their export potential rather than importing from other countries as they define their space in the African trading value chain.

The estimated coefficient of income inequality proxied by the Gini coefficient ($\ln\text{Gini}$) is positive and significant, and as such increases poverty. This result is theoretically expected as an increase in income inequality leads to an increase in the proportion of people living below the international poverty line. This means that an increase in the level of income inequality is associated with higher poverty in Africa. This result is consistent with the findings of the World Bank (2009); Anyanwu and Erhijakpor (2010); Chan and Ravallion (2008).

The estimated coefficient of inflation ($\ln\text{Inf}$) is surprisingly negative and significant across the poverty incidence and intensity. This suggests that an increase in prices of general goods and services does not worsen the poverty level in Africa. This result happens to be in line with the findings of Gnanangnon (2019). However, our result be inconclusive as there may be some hidden effect that might have emanated from the distinct features of the sampled countries.

Regarding international remittances ($\ln\text{Rem}$), the estimated coefficient is negative and statistically significant across the estimated models. The result suggests that generating remittances from migrants help to improve the living conditions as well as reduce the debt, level and severity of poverty in Africa. This result is supported by the findings of Leliveld (1997); Adams and Page (2005); IMF (2005); and Stark and Taylor (1989). The estimated coefficient on literacy proxied by secondary education levels ($\ln\text{Secsch}$) is negative under both poverty incidence and intensity. The result concurs with our expectations and suggests that education has the potential to improve the Standard of living through the mobilisation and distribution of skilled human capital which substantially creates bigger opportunities for people, thereby reducing poverty. The result is consistent with the findings of Oxaal (1997); Navaratnam (1986); and Abdulahi (2008). The estimated coefficient of population growth ($\ln\text{Pop}$), under PVHC is negative and significant. This is theoretically unexpected as we expected population growth to increase poverty occurrences as people struggle with limited available resources. However, $\ln\text{pop}$ is positive and significant under PVGAP as expected based on the theory that a rise in population growth will lead to a decrease in per capita income, and subsequently causes an increase in the poverty level (Birdsall, 1980). With

regards to the estimated coefficient of contiguity in column (1), it is positive and significant under poverty incidence and poverty intensity in column (3). This suggests that contiguity in TBs does not reduce poverty as theoretically expected with regard to the literature review. Concerning government health expenditure, the coefficient is surprisingly positive but not statistically significant under PVHC, but significant under PVGAP. This is not theoretically expected. However, this result is not far-fetched considering the poor health system in Africa which is attributed to the negligence of the governments towards health expenditure since prominent government officials get their medical attention abroad.

The estimated coefficient of financial development proxied by domestic credit to GDP is negative but not significant across all the estimated models. This suggests that proper financial systems and easy access to credit have the potential to lift people out of poverty in Africa as access to credit brings about investments. In other words, easier access to credit will enable the poor to participate more in TBs thereby escaping the poverty trap (Goff and Sing, 2014). With regard to the quality of institutions (LnInst), the coefficient is positive under Poverty incidence, this suggests that TB is associated with a lower level of poverty only when African institutions are more efficient and less corrupt-ridden (Beck, and Levine, 2007).

Our second research question aims to establish whether TBs between countries that share geographical border(s), stimulates poverty reduction in Africa. column (2) and column (4) in Table 6 answer our second research question specified in equation (3.11), which contains the interaction term of TB and contiguity (i.e. TBs*Contig). The estimation results in column (2), show that TBs between countries that share border does not reduce poverty. With the coefficient of the interactive term, poverty increases by 0.1518%, which is statistically significant at 05% level under poverty incidence. This suggests that TBs between countries that share border(s) is associated with increase in poverty, this does not align with our theoretical literature which explains that TBs stand to benefit the poor due to the proximity between the country's trading partner(s). This explains that the potential gain expected to be realised, especially by the poor through TBs, is under-utilised and hindered due to the level of poor infrastructure in Africa. Under poverty intensity in column (4), the robust coefficient of the interaction term is also positive but not significant.

Similar to research question 1, the explanatory variables of which the coefficients have the same results as in research question 2 are CBT, GDP per capita, distance, import share, export share, remittances, inflation, literacy, population, institution and financial development. While the explanatory variables in research question 2 whose results differ

from research question 1 are Gini, Contiguity and Health. In column (2) of table 6, the coefficient of income inequality (lnGini) is positive and statistically significant at 1% under the poverty incidence, implying that high inequality negatively affects proceeds from Trade integration as well as increases the level of poverty. However, inequality is negative and significant under poverty intensity.

Coefficient of health indicates a positive coefficient and is statistically insignificant under poverty incidence and poverty intensity. This result coincided with the similar finding of Aboubacar and Xu (2017), which shows that the impact of government health expenditure on economic growth and poverty reduction of countries with closed borders is of little or no magnitude, following weak and deficient health care systems across Africa which tends to increase the poverty level as the poor spend most of the little income on medical related expenditures.

Possible reason for the reductions in the number of our observations is missing data, where it is suspected that some of our data point cannot be further included in the analysis because of their missing values, which might have made the affected observations to be dropped in table five of our OLS, FE and RE regression.

Another possible reason might be data merging and alignment coming from lack of time periods where unmatched observations might have been are excluded. Similarly, it is possible that our time series and panel data analysis, that made use of lagged variables and first differences reduced the sample size. Where the inclusion of a lagged dependent variable and differencing removes one observation per cross-sectional unit.

Also, in a panel data models with fixed effects, reductions are likely to occur where a single time observation cannot contribute to the estimation because of unit variation that is required. As a result, countries with only one observation are dropped automatically by Stata software to improve estimation quality.

Also is the issue of functional transformations of variables which might have generated missing values that makes logarithm to excludes all zero and negative values, while creating ratios thereby eliminating cases where the denominator equals zero. Moreover, perfect multicollinearity or perfect prediction may cause certain variables associated with our observations to be dropped by the Stata software. Finally, some observations in our panel data may lack valid weighting making them to be excluded from weighted analyses.

In summary, the result analysis indicates that TBs may be poverty-reducing in Africa as the coefficient of TB is negative and are such decreasing poverty, which is consistent with the results of all the other estimation techniques utilised in the study and also aligns with our theoretical and empirical literature. However, the result is opposite amongst countries that share borders, as its coefficient is positive and, as such, increases poverty, contrary to our expectations. This implies that the interaction between countries that share borders in trade could be increasing poverty. This outcome is not consistent with the theoretical literature, because the poor economic agents participating in TBs (especially the unskilled) are expected to benefit from TBs with countries they share borders due to the apparent advantages such as shorter distances with lesser transport costs, lesser immigration related restrictions, common language, tariff removal/reduction, quotas, licences, etc. However, a reversed outcome could be attributed to poor and deficient cross-border infrastructure and maintenance in Africa, which might have adversely affected the PVHC ratio. These infrastructural deficiencies, such as untarred and unpaved roads, inefficient energy systems, weak communication channels, poor railway links, absence of a proper road network connecting countries in Africa and lack of cargo facilities, might have affected the inflow and outflow of bilateral trade. This might have also resulted in delays in the transportation of goods and goods getting damaged while on transit before arriving at their respective destinations. This shows that the poor still could not utilise the full potential of TBs' engagements following these impediments. Although the outcome does not agree with our expectations, it correspond with the high-income inequality registered in Table 6 (under PVHC), which indicated an increase in the proportion of people

still living beneath the poverty line. Therefore, dealing with this problem head-on will not only reduce poverty amongst countries that share borders, but will also enhance TBs, growth and poverty reduction in the whole of the African continent

When it comes to specific African Trade Blocs in Table 6, the findings of our analysis indicate that TBs could have a poverty reduction impact in Africa, as the coefficient of TBs is negative across all trade blocs under the poverty gap, except for EAC. The poverty-reducing outcome of our analysis is consistent with our expectations, coming from the fact that as more economic agents participate in trade, the proceeds and gains from trade will bring about an increase in the standard of living of those participants. This reductive outcome also supports the findings of all other estimating methodologies used in this study. However, poverty seems to be increasing under the EAC trade Bloc, as its coefficients are positive for both poverty headcount and poverty gap. This non-reducing effect on EAC could be linked to low income per capita and high-income inequality, which emanates from political instability in the region (McAuliffe, 2020). Also, is the problem of skills gaps and unequal access to job opportunities, whereby access to capital and job opportunities lags for poor households despite growth accelerating, as the poor continue to struggle to connect to productive jobs and markets due to skills shortages (World Bank, 2023).

Moreover, IMF (2023), noted that most poor households in East Africa; Burundi, Somalia and Southern Sudan, for example, still depend on low-productivity agriculture with less sophisticated manufacturing scale that prevents trade expansion to translate into job creation. The climate and fragility shocks, such as droughts, floods, and conflict, which are prevalent in most parts of the Bloc (and among new member Nations), also disrupt production and trade and, as such, erode assets, and push vulnerable households back into poverty. Intra-EAC trade still represents about 15% of total trade only despite its survival. Also, is the issue of selective tariff and non-tariff barriers; poor infrastructure, and border inefficiencies raise costs and prevent small traders (especially women) from benefiting from trade. Therefore, trade integration policies must be paired with structural transformation and inclusive development policies, like promoting Agricultural Transformation, investing in irrigation and climate-resilient crops, and value chains to raise farm productivity and reduce reliance on subsistence farming. Countries such as Burundi and South Sudan require modernisation of smallholder agriculture to reduce food insecurity.

Chapter 5: Conclusion and Policy Implications

5.1 Key Findings on Africa's Trade Blocs.

The purpose of this study is to assess the effects of Trade Blocs (TBs) on poverty reduction in Africa. Secondly to investigate the effect of the interaction of TBs and Contiguity on poverty reduction among countries that shares geographical borders in Africa. This is motivated to find out if the poverty reduction effect of TBs in Africa is more or less when compared with the effect TBs among countries that shares close borders in Africa. The outcome of the study will add to the existing literature by detecting if the establishments of more Trade blocs will help to reduce poverty or there's a need for other development strategies other than trade blocs in Africa. The outcome of this study is also essential for achieving the policy objectives set out by the Sustainable Development Goals (SDGs) towards poverty reduction.

The study used OLS, RE and GMM estimation technique as empirical tools to achieve the objectives of the study. Bilateral trade import, bilateral trade export, total import, total export, and distance were used to measure TBs. Following literatures, the control variables employed in the study are contiguity, income inequality, international remittances, inflation, literacy (measured by secondary school level), population size, real GDP per capita and financial development measured by private domestic credit.

The result of our analysis in answering our first research question, whether TBs impact on poverty reduction, indicates that Trade Blocs in Africa (TBs) is associated with poverty reduction, coming from several benefits they are obtaining from bilateral trade, higher exports volumes, remittances which has resulted to lower income inequality in most part of Africa etc, as seen in our sampled countries except for EAC where our estimated coefficient is positive, suggesting increasing poverty, although this outcome differ from other Blocs as indicated in our estimation. There seem to be many gains associated with Trade Bloc membership as TBs enhanced export flows of our successful member nations. This outcome implies that the rest of the African Trade Blocs should dismantle the remaining tariff and non-tariff trade barriers that are still militating against them from benefiting fully from the Trade Bloc as demonstrated in EAC Bloc.

The result of our second research question on the effect of proximity on poverty indicated that closed border Trade does not reduce poverty. Therefore, we recommend that trade

reforms should include policies that will enhance infrastructural improvements which might have militated against cross border trade. Improvement in Infrastructure; we believe, will improve trade flows among African countries that share borders with the potentiality of benefiting the poor participating agents as they find it easier to engage in proximity border trade that cost them less, which then makes the inter trade a pro poor.

5.2 Policy recommendation are as follows;

Our subsequent policy recommendation follows the idea that enhancing inter-trade of which TBs is an example will promote economic growth in a country which will attract more foreign direct investment that will create jobs and ultimately reduce poverty. Therefore, African economies must create and execute policies that will support more trade agreements, for more poverty reduction initiatives as we have seen with most of the trade Blocs sampled in the study

Future policy plans should include investments in road network and other infrastructure to enhance the ability of poor people to access the markets and as such promote more trade across the African continent. This should be supplemented by the effective removal of all the remaining tariffs and quotas to lessen the hurdles that economic agents experience while engaging in trade, as well as the revocation of any trade restrictions for countries that share borders. This will increase Africa's ability to trade freely with other African countries, thereby reducing existing gaps in the continental African border trade.

Furthermore, Africa must improve the quality of its financial institutions in order to promote credit creation for productive reasons, which will help to finance new investments and widen our industries while establishing and fostering our infant industries together with new talents.

Effective reallocation of productive resources, increase in the investment ratio especially in the manufacturing sector, and the promotion of small-scale businesses in the informal sector of African economies can all be achieved through policies that prioritise their growth and development as well as promoting entrepreneurial skills, all of which will boost trade on the continent and reduce poverty for the young entrepreneurs.

Considering these evidences, policymakers ought to create tools such as workforce skill development, guaranteed employment programs for youth after school, conditional cash transfers, increased access to healthcare and education through increased government social

expenditure, affirmative action in the face of high-income inequality, which has been shown to increase poverty levels in Africa.

Our conclusive recommendation is for African economies to embrace a borderless African Trade Agreement as it has more potential to yield optimum benefit for all of Africa, which will give the continent a competitive edge in the global market and as such, help Africa to overcome the dominance of the west. Also, is the issue of infrastructural development in Africa which is the most militating factor against cross-border trade in Africa; Policies that will prioritise improvement of infrastructures should take precedent over corrupt political ambitions that are prevalence in Africa to ease out trade hurdles in Africa.

By successfully implementing these policy changes, Africa may be able to break away from the intergenerational poverty trap and experience more equal and resourceful growth. Additionally, putting our policy ideas into practice will contribute to a rise in trade, which will generate more trade led growth and more policies that will assist in lowering the percentage of the population living in poverty and guarantee the continent of Africa, long term development.

5.3 Limitations and suggestions for future Research

Just like every other empirical study, this study has few limitations. The study must have been affected by conceptual and data related issues, where empirical model we employed to assess bilateral trade flows in our econometric equations is not derived from the behaviours of the economic agents directly but rather based on theoretical underpinning as described by Krugman (1980); and Bernard et al. (2003). However, our theoretical and empirical underpinnings do prove that GMM is empirically consistent with our research area. Also, is the limitation from data fragmentation and data inconsistency that arises from multiple memberships, e.g. Zimbabwe in SADC and also in COMESA, which makes it difficult to isolate one membership from another and identify which agreement is influencing trade flows, growth, or poverty reduction. This is compounded by the fact that trade statistics are reported differently across TBs, and some countries double-count intra-African trade under different TBs. This also might have impacted our empirical analysis negatively, making our outcomes less reliable (UNECA, 2025). Another limitation lies with the statistical data, since Africa's available data might be inaccurate as some of our African cross-border trades are not recorded which might have led to biased data in our estimation, together with the consensus

that constant use of official trade statistics will likely under estimate the actual value of intra-African trade flows. Forountan and Pritchett (1993) also noted the limitations, such as poor recording by some customs officials which bring discrepancies in the available data for trade partners, which might wrongly indicate an inter-trade outcome. Also, is the issue of unavailable of some statistical data that might have been caused by errors and omissions by data handlers. We believe that future researchers might be able to deal with these issues as more data sources and econometric techniques become available.

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