

Relating trade liberalisation and increased intra-African trade volume

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Abstract

Introduction: Trade liberalisation in Sub-Saharan Africa (SSA) has long been considered as a catalyst for increasing intra-African trade. This study delves into the variables of trade liberalisation, and explores the individual, and interconnected effects it has on intra-African trade volume.

Methodology: The research employed three established econometric techniques: Generalized Method of Moments (GMM), system GMM, and Fixed Effects Model, to ensure robustness of the findings. These methods are applied to a comprehensive panel dataset, encompassing 10 randomly selected SSA countries, spanning a decade (2010 – 2019).

Findings: The analysis reveals that, while trade liberalisation exerts a positive effect on increasing intra-African trade volume, most of the variables comprising trade liberalisation lack statistical significance. Notably, the research underscores the statistically significant, and positive effect of a country's previous intra-African trade performance on augmenting intra-African trade volume. This outcome supports the prevailing view that, the gains of trade liberalisation materialise in the medium to long term.

Implications: These findings bear particular relevance in the context of the AfCFTA, underscoring the importance of ongoing trade liberalisation efforts among its signatory nations. This research sheds light on areas where future policy interventions and trade facilitation measures can be refined to harness the full potential of intra-African trade.

Keywords

Intra-African

Trade

Liberalisation

GMM

Fixed Effect

Plagiarism Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Master of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

1st November, 2023

Contents

Abstract	ii
Keywords	iii
Plagiarism Declaration	iv
Chapter 1 – Research Problem and Purpose	1
1.1 Research Problem.....	1
1.2 Research Purpose.....	3
1.3 Business Purpose.....	5
1.4 Thematic flow of research	8
Chapter 2 – Literature Review	9
2.1 Review of Academic Literature.....	9
2.2 Relevant Theoretical Frameworks	12
2.3 Ricardian Comparative Advantage Theory.....	13
2.4 Heckscher-Ohlin (H-O) Theory.....	14
2.5 Imperfect Competition & Multinational Theory	16
2.5.1 Imperfect Competition in SSA	16
2.5.2 Multinational Company Theory.....	21
2.6 Dynamic Panel Data Analysis.....	23
2.7 Literary Gap.....	24
Chapter 3 – Research Question	27
Chapter 4 – Methodology	29
4.1 Research Methodology.....	31
4.2 Population Choice.....	31
4.3 Unit of Analysis	32
4.4 Sampling Size and Method	32
4.5 Measurement Instruments.....	33
4.5.1 Dependent Variable	35

4.5.2 Independent Variables.....	36
4.5.3 System Generalised Method of Moments	38
4.6 Data Gathering Procedure	38
4.7 Data Analysis Approach	38
4.8 Data Quality Controls and Limitations	39
Chapter 5 – Research Findings	41
5.1 Descriptive Research Statistics of Sample Panel Data	41
5.2 Data Visualisations	43
5.2.1 Index of Trade Freedom.....	43
5.2.2 Cost to Trade	44
5.2.3 GDP per Capita	45
5.2.4 Gross Merchandise Trade.....	46
5.2.5 Logistics Performance Index	47
5.2.6 Trade (% of GDP) – Trade Openness.....	48
5.3 Data Analysis.....	49
5.3.1 Generalised Method of Moments (GMM)	54
5.3.2 Difference Generalised Method of Moments (GMM).....	56
5.3.3 Fixed Effect Model.....	59
5.3.4 System Generalised Method of Moments (GMM).....	60
5.4 Summary of Findings	61
Chapter 6 – Discussion of Results	63
6.1 Observed Complexities in Trade Liberalisation	63
6.2 Theoretical Observations in the Results	73
6.2.1 Effect of Comparative Advantage in the Results.....	74

6.2.2 Effect of H-O Theory in the Results.....	75
6.2.3 Effect of Imperfect Competition & MNC theory in the Results	77
6.3 Answer to the Research Question	78
Chapter 7 – Conclusions and Recommendations	80
7.1 Model Summary of Research Findings and Recommendations	87
References	90
Appendix	103
A. MNC contribution to SSA GDP – GNI versus GDP	103

Chapter 1 – Research Problem and Purpose

1.1 Research Problem

When cross-border trade is executed in the right way, it positively contributes to the economic development of nations and individual households across the globe (UNECA, AUC, AfDB, 2014). For centuries, trade has been the engine that increased multilateral cooperation among nations. Furthermore, when regional trade agreements (RTA) exist between countries, an observable increase in trading volume is noted between the member countries of the RTA, as demonstrated in research conducted by Dai, Yotov and Zylkin (2013). Fundamental elements, including developed infrastructure, political stability, and appropriate economic policies contribute to the building of linkages that promote trade (Longo & Sekkat, 2004).

As some African economies seek to develop their own industrial and manufacturing capacity, governments tend to adopt inward-looking, short-view protectionist policies; intent on supporting the growth of their local industrial capabilities (Cambazoğlu, 2020). Protectionist policies are adopted by governments to keep foreign public debt low, where foreign debt is unfavourable, and runs the risk of stunting economic growth in developing countries. This position is detailed by Edo (2023), who intimates that a combination of trade openness and low domestic public debt positively contributes to increased economic growth.

African countries have, both historically and presently, focused on exporting its natural resources and agricultural products beyond the Continent, whilst heavily depending on importation of value added semi-finished and finished products (Obeng-Odoom, 2020). Intra-African trade remains exceptionally low at 15%, especially when compared with other regions. Intra-European trade for instance, is estimated at 67%, intra-Asian trade at 61%, and trade within the America's at 47% (UNCTAD, 2019). Indeed, African states trade more with Asia, Europe, and the Americas than they do with one another.

Trade liberalisation has been posited as a framework that supports the economic prosperity of developing nations in Africa, by increasing intra-African trade as a means towards economic development. This view has motivated many countries in Sub-Saharan Africa (SSA) to reduce import tariffs from an average 20% in the 1980s to 5% by 2014

(Anderson E. , 2020). Albeit that the adoption of these policies was aimed at reducing poverty, creating jobs, and building local industrial and manufacturing capability, these areas remain a major issue in many SSA countries. Even more so, there remains low intra-African trade activity between countries on the continent.

The African Continental Free Trade Area (AfCFTA), since its enforcement in 2019, is touted as the largest free trade area in the world, surpassing the geographical size the European Union, with a potential combined GDP of US\$3 trillion (International Monetary Fund, 2023). With a mandate to eliminate barriers to trade, and to boost intra-African trade (AfCFTA, 2023), the free trade area (FTA) requires African countries with historically high barriers to trade to dismantle these through progressive trade liberalisation.

The AfCFTA charter seeks to create a continental trading area that surpasses established traditional, classical, and neo-classical trade theories, in favour of a pan-African framework (Obeng-Odoom, 2020). Such a pan-African framework supports a sequential transition to trade liberalisation on the continent. The AfCFTA in itself advocates for the removal of trade policies adopted by African nations that have opened these nations up to become vulnerable to external market shocks and volatilities, due to increasing global protectionist measures (International Monetary Fund, 2023). Thus, the FTA provides the possibility for domestic African economies to remain competitive in global trade.

Whilst it is noted that there exists a large library of literature on the effect of trade liberalisation on the economic growth of nations, trade liberalisation within such literature has often been intertwined and equated as trade openness (Alam & Sumon, 2020). This research report argues that trade openness is a component of trade liberalisation, and as such does not completely equate to liberalisation.

Trade liberalisation within this research report, is considered to be those policies and actions taken by any given nation to reduce the constraints faced by firms and traders (importers and exporters) in order to trade across borders with the rest of the world. It includes the elimination or reduction of trade barriers, whether tariff or non-tariff barriers (Wacziarg & Welch, 2008). This is differentiated from trade openness, which brings into

account the sheer size of any given country's economy that is involved in international trade.

In simpler terms, trade openness highlights how willing a nation is to engage in international trade, and is represented as a ratio of a country's total trade (exports + imports) to the country's gross domestic product (GDP) (Ulaşan, 2015). The contribution of trade to the country's overall GDP, highlights how open the country is to global trade.

Taking the noted differences in the definitions above, this research considers trade openness to be a part of the variables that should be taken into account when assessing the degree of liberalisation of any nation.

What remains uncertain, however, is precisely what effect trade liberalisation has on increasing intra-African trade volume. Indeed, there remains no definite guarantee proving that an increase in intra-African trade volume would lead to an increase in the welfare of the African population (UNCTAD, 2019).

1.2 Research Purpose

The argument for liberalisation is centred on the deliberate reduction of barriers to trade raw goods, semi-finished and finished goods, and services across international borders (Ali, Kiani, & Hafeez, 2018). Due to the fact that a majority of African economies continue to perceive import tariffs as a major source of revenue for the state, their commitment to implementing trade liberalisation initiatives will be weighed against the gains from any trade liberalisation initiatives, and the possibilities of building and developing local industrial capacity, that leads to sustained economic growth.

Many developing economies that have implemented trade liberalisation initiatives, especially those in Africa, have not been able to fully take advantage of their openness to trade (Yameogo & Omojolaibi, 2021). It is oftentimes the case that the local manufacturing industry, infrastructure, and institutional policy frameworks struggle to compete with products from the global markets. Indeed, the overwhelming inability of African industrial complexes to compete successfully in the global market highlights the need of an African marketplace that supports local businesses, and increases economic self-reliance towards sustained development (UNCTAD, 2019).

It is prudent to acknowledge the legacies of some African nations and governments which retain neo-colonial concerns during negotiations and engagements around trade agreements in any form. The early critiques of neo-colonialism, as illustrated in the works of Sekou Touré (Africa's future in the world) in 1962, and Kwame Nkrumah (Neo-colonialism: The last stage of imperialism) in 1965, raised concerns about the possible trappings of African nations in trade agreements with the then European Economic Community (EEC) (Langan & Price, 2020).

These arguments were based on the premise that such free trade agreements at their time of writing, led to external powers indirectly holding control over independent African states due to the states economic dependence on the EEC for access to their markets and value added products. This, Nkrumah and Touré warned, would foreclose diversification of African industry and stifle domestic value addition.

The introduction of the AfCFTA seeks to increase intra-African trade by forming a single African marketplace and building the industrial capabilities of the continent. It also looks to contribute towards reducing the cost to trade in the continent. This sets up a new incentive for states to embrace liberalisation initiatives. Trade costs in SSA are comparatively higher than they are most regions of the world (Portugal-Perez & Wilson, 2009), and trade liberalisation could possibly reduce the overall cost to trade in Africa. Indeed, the reduced costs of doing cross-border trade in could encourage local SMEs to engage in expanded intra-African trade and commerce, thereby increasing the number of enterprises involved in formal trade across the continent.

The creation of a continent-wide FTA in Africa presents significant benefits, including strengthened value chains, fostering industrial specialisations, and generating developmental spill over across the Continent (Longo & Sekkat, 2004). Spill-overs, driven by increased trade among African nations, contributes to the grand industrial growth of the Continent. Consequently, it is crucial to examine the relationship between trade liberalisation and the growth of intra-African trade volumes.

In the conversation of trade liberalisation, it is essential to also address the key concept of trade diversion as expressed from traditional trade theory. Trade diversion refers to the redirection of trade from more efficient partners outside the FTA, towards other members within the FTA (Clausing, 2001; Dai, Yotov, & Zylkin, 2013; He & Dang, 2023).

Although trade liberalisation typically mitigates the challenges of trade diversion in the form of trade creation, it is key for economies to find the right balance between import substitution from outside the FTA, and local sustenance within the continental marketplace. Although multiple empirical studies have been conducted on the phenomenon of trade diversion and trade creation, it remains a complex task to balance. Achieving this equilibrium is nonetheless crucial to ensure that the FTA's succeed.

This research report considers the complexities of trade liberalisation in SSA, and explores its contribution towards increasing intra-African trade volume. As the drive to grow intra-African trade is spearheaded by the concept of the AfCFTA, the research details those trade theories that informed the current approach to intra-African trade. Particularly, this research report reviews the traditional theories of comparative advantage (Dornbusch, Fischer, & Samuelson, 1977), as well as newer trade theories (Obeng-Odoom, 2020). In using recent trade data, and analysing trends within the data using a dynamic panel regression, the research assesses the relationship between trade liberalisation and increased intra-African trade volume.

1.3 Business Purpose

The World Bank measures the liberalisation of trade in countries using its Trade Openness Index. However, it is important to note that, while a higher openness index for a country is expected to positively correlate with economic growth, there is no guarantee nor deterministic relationship between these two variables (UNECA, AUC, AfDB, 2014). With increased liberalisation, local economies are exposed to varying levels of competition and standards, and as such, this encourages their industries to specialise in sectors and fields within their areas of greatest advantage (Jiao, Shen, & Liu, 2022).

In the context of liberalised trading regimes in Africa, African private businesses stand to gain significant benefits. One such benefit is access to larger regional markets, which are characterised by a diverse customer base (Ngepah & Udeagha, 2018). This also allows businesses to tap into new consumer segments, across the larger African market place, whilst engaging with new firms across various value chains. Additionally, functional liberalisation policies encourage foreign direct investments (FDI) in the area(s) in which liberalisation policies have been implemented, thereby providing local

businesses with additional capital and resources (UNECA, AUC, AfDB, 2014). These FDI inflows contribute to the growth and expansion of businesses, and enhances their global competitiveness.

Antràs, Desai, and Foley (2009) developed a model that showcased the increase in the globalisation of multinational firms operations, and the associated flows in capital and market development investments. Their model highlighted key elements of such investments; specifically, the ruling out of exports from multinational firms in developing economies, to unrelated entities in foreign markets. This position was derived by considering the tradeoffs observed in local production vis-à-vis overseas production overseas, further reiterating the relevance of improved trade liberalisation initiatives across the continent.

Africa's current trade landscape is predominantly characterised by external trade partnerships. The largest trading partners of the continent are located outside the continent (World Bank, 2023). In 2020, intra-African trade accounted for only 24.9% of all African exports, whilst Europe and central Asia accounted for 28.5% and eastern Asia and the Pacific regions accounted for 22.24% of exports. This same year (2020), also saw intra-African imports of only 15.42%, compared to 30.9% from east Asia and the Pacific and 27.8% from Europe and central Asia (World Bank, 2023). This poses inherent uncertainties (risks and opportunities) for African businesses, based on a combination of factors that could affect these external trading partners, such as conflicts, economic volatility, and trade restrictions.

Instances of such uncertainties include the effects of the economic disputes and decoupling between the United States and China (An, Mikhaylov, & Richter, 2020). Another instance of this was the Russo-Ukraine war, which had a negative trade effect on many African economies (Silva, Wilhelm, & Tabak, 2023) and unsettled their economic resilience and stability.

There was also the spike in coup d'états in the Sahel region of SSA, namely in Mali, in August 2020; Chad in April 2021; Guinea in September 2021; Burkina Faso in January 2022, which saw two coups in that same year; Niger in July 2023, and Gabon in August 2023 (Al Jazeera, 2023). The predominant reason presented by the putschists in the

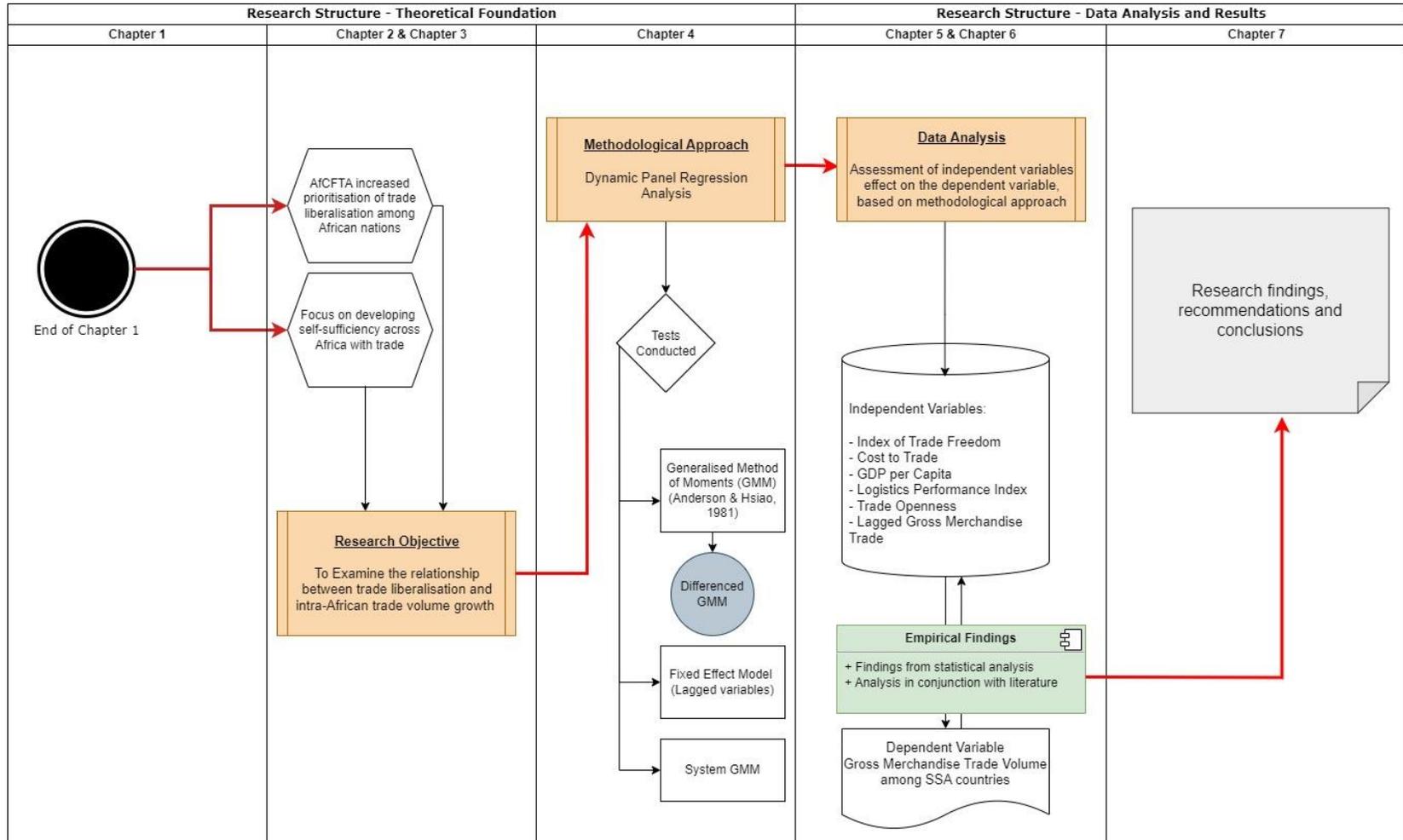
countries in which they successfully seized power, were concerns regarding the dire economic challenges faced by the population, as well as broader national insecurity.

Such aggressive shakeups in the countries of the region detrimentally affects the interest of international investors, including those from other African nations, curtailing investments within the region. This is observed in the largely negative net foreign direct investment flows from these countries (World Bank, 2023). This further reinforces the pressing need to prioritise and enhance intra-African trade, as a solution to improving the capabilities, resilience and security of crucial sectors, such as agriculture, pharmaceuticals, and other commercial functions, that strengthen economic development.

1.4 Thematic flow of research

Figure 1 below provides a simple thematic structure of the research from this page onwards.

Figure 1 – Thematic Research Structure



Chapter 2 – Literature Review

2.1 Review of Academic Literature

A significant amount of academic literature has been developed, covering the impact of trade liberalisation on trade in Africa. However, there remains significant gaps in knowledge, and this research seeks to reduce these gaps. The research contributes to the body of knowledge by exploring how the volume of trade between African countries can be boosted. More specifically, it aims to determine how significant the liberalisation of trade across regional economic communities on the continent, will contribute to increased intra-African trade.

Data published by the World Trade Organisation (WTO) in December 2021, has highlighted a surge in cumulative notifications of regional trade agreements (RTAs), with 582 total agreements reached in the given year. A majority 65% of these agreements are currently in force (WTO, 2023), which underscores the extensive participation of nations, including those in Africa, in trade liberalisation endeavours.

Facchini, Silva and Willmann (2021) applied a model on political economy, to highlight the importance of trade balances and income distribution, prior to a nation participating in a liberalised trade area. The model highlights the need for trade imbalances among members of a liberalised trading regime, such as a regional trade agreement, or a preferential trade agreement, to be equalised where possible. Countries with a negative trade balance are likely to be hesitant in adopting liberalisation initiatives, as their industries and firms may face unequal market competition.

The study of Facchini, Silva and Willmann becomes of relevance upon taking into account the broad state of income inequality (Enongene, 2023), and trade deficits faced in African nations. They recommended for income inequality and trade imbalances among nations that are part of a RTA to be low, in order for such trade agreements to become politically viable.

Nations that have increased income inequalities and low distribution of wealth, may face limited interest in trade liberalisation initiatives. The economic gains made by oligopolistic firms in income unequal economies may not trickle down to the average

citizen, and thus may cause the liberalisation initiative to not become politically viable for some nations (Facchini, Silva, & Willmann, 2021).

The oligopolistic nature of markets in SSA, and the approach used by firms to compete within these markets, are reviewed by Abdu and Jibir (2019). Their study revealed that only a few firms demonstrated market power to raise and maintain prices of their products above that which would have been set in a perfectly competitive market. Using a Tobit panel model, Abdu and Jibir reported between 20-60% of markets in SSA were controlled by those few firms. They also found that a significant number of firms in the region controlled less than 20% of markets. Thus, trade liberalisation may, in effect, only benefit the few firms that have market power, where any change in trade volume may be associated with intra-company trade.

Alam and Sumon (2020), applied a panel cointegration and causality analysis of 15 Asian countries from 1990–2017, which assessed the relationship between trade openness and economic growth. Their research identified a positive impact of trade openness on economic growth through increased trading volume. By utilising a Granger causality analysis, they revealed a bidirectional causality between economic growth and trade openness. Their research article highlighted the widely accepted position of economies growing faster, relative to their relative degree of openness. This was further qualified by the evidence shown in *Free trade, Growth, and Convergence* (Ben-David & Loewy, 1998), which showed that in the long-run, trade liberalisation unambiguously generates steady economic growth for those countries that adopt it.

The establishment of the African continental free trade area signified a transformative milestone, transcending classical, neoclassical, and contemporary trade theories (Obeng-Odoom, 2020), with the potential to rectify trade imbalances and enhance overall income distribution. Awad, (2019) underscored the positive ramifications of heightened intra-African trade, serving as a catalyst for bolstering economic growth across the continent, curbing environmental degradation, and bolstering the prospects of achieving many of the Sustainable Development Goals (SDGs).

Although there exists a scholarly consensus affirming the substantial advantages that African nations gain from intensifying trade interactions amongst themselves (Ngepah & Udeagha, 2018), Obeng-Odoom, (2020) have argued that the objectives of the

AfCFTA, including the agenda to liberalise trade among African countries, could be negated, and may lead to increased income inequality and poverty, if reformations on land rights and labour are not acted upon. His research on the AfCFTA highlighted critical factors in global trade, such as production and trading routes, that tend to favour the interests of economically dominant actors.

The panel evidence presented by Ulaşan (2015) showcased that simply having lower trade barriers is not necessarily related to increased economic growth. In his research, Ulaşan applied an augmented form of the neoclassical growth model from 1960-2000. The research estimated a first-differenced and system-generalised method of moments analysis, and expanded the neoclassical growth model variables to include trade openness as part of the empirical model. The analysis, taking into account all openness measures, including real openness and import duties, were not significantly associated with conditions of economic growth. This is indicative of the fact that trade openness on its own would not increase economic growth.

The growth in scepticism of trade liberalisation and trade openness in driving economic growth of economies was largely fueled by the work of Rodriguez and Rodrik (2000). Their research argued that methodological measures are used in the prior analysis (Sachs & Warner, 1995; Edwards, 1998), were poor measures of trade, and were often correlated with other economic indicators that demonstrated poor performance. In addition to concerns regarding the methods used to link openness in trade policy to economic growth, their findings highlighted weak evidence of lower barriers to trade having a significant association with increased trade and economic growth.

Subsequent research conducted by Wacziarg and Welch (2008) brought about new evidence that updates the Sachs-Warner criteria of assessing the effect of trade liberalisation on economic growth (Sachs & Warner, 1995). Their research was prompted by the findings of the report by Rodriguez and Rodrik on the shortcomings of existing models of economic growth associations with trade liberalisation. They identified the limitations of the crude nature of Sachs and Warner's simple dichotomous indicators in capturing the complexities of barriers to trade.

The new approach by Wacziarg and Welch (2008) took into account the dates of liberalisation of each country, over a 48-year period. It identified that countries that

liberalised their trade policies observed a 1.5% increase in their economic growth rate, as compared to pre-liberalisation. They also observed that investment rates increased by up to two percent. They however did identify that, some trade policies implemented by countries could negate the positive effects of trade liberalisation reform, as seen within the large differences in economic growth between various countries.

Nonetheless, Obeng-Odoom's research on the AfCFTA also highlighted the great benefits African nations could obtain through the ratification and proper execution of the FTA. Confidence in the opportunity of the FTA gains further credence through the collective commitment to, endorsement of, and participation of 54 out of 55 African countries in the AfCFTA (AfCFTA, 2023).

2.2 Relevant Theoretical Frameworks

The fundamental theories that supported the foundation of the AfCFTA, are classified under classical, neo-classical, and contemporary trade theories. Obeng-Odoom's (2020) research study of the AfCFTA underscores the intrinsic nature of these theories and emphasises their shared recognition and positive impact of trade on nations, through the diffusion of technology and the development of labour skills.

Obeng-Odoom continues to add that the AfCFTA diverges from certain tenets of legacy trade theories, such as in the notion of minimal government intervention in trade promotion. However, with key shortfalls found to be inherent in legacy trade theories, the AfCFTA could falter (Obeng-Odoom, 2020) and fail to meet its continental objectives. As such, it is warranted for this research to scrutinise these theories as part of its review of literature.

The specific trade theories this study explores are theories of comparative advantage, and the Heckscher-Ohlin. The choice of these theories is in alignment with the prior research by Yameogo & Omojolaibi (2021), who considered both Heckscher-Ohlin theory and Stolper-Samuelson theory (an extension of the comparative advantage theorem), to study the relationship between trade openness, economic growth, and poverty levels in 40 SSA countries between 1990 and 2017.

The research also takes into account the theories of imperfect competition and multinational firm theory. These theories are relevant here as they have implications on

the effect of trade liberalisation initiatives on any increased trading volume among countries in the SSA region.

The effect of imperfect market competition is highlighted within other literature under this topic, including the works of Obeng-Odoom (2020), who highlighted that, whilst most exports from African countries are centered around natural resources, the market structures and firm strategy of such exports are monopolistic in nature. Obeng-Odoom (2020) also highlighted the lack of consideration of monopolistic competition and its effect under the AfCFTA approach to liberalisation of trade in Africa.

The work of Obeng-Odoom also raised concerns regarding the effect of multinational firms, as described in multinational firm theory. Key areas of concern included the significant benefits multinational firms gained from the liberalisation of trade. His consideration took into account the natural resources that are largely exported by African countries, are typically mined, refined and processed largely by multinational firms, where by extension, the lower cost of trade only serves to benefit the firm.

Ngepah and Udeagha (2018), applied the gravity model in an empirical analysis of regional trade agreements in Africa, focusing on the years of 1995 to 2014. Longo and Sekkat (2004) also deployed the gravity model in assessing the influence of infrastructure, economic policy, and political stability in expanding intra-African trade.

As this research seeks to unravel the relationship between trade liberalisation and increased intra-African trade, an assessment of the most appropriate model based on prior research methods was conducted and selected.

2.3 Ricardian Comparative Advantage Theory

The theory of comparative advantage, initially introduced by David Ricardo in his work published in 1817, suggests that nations and economies ought to focus on producing goods where they have a relative comparative advantage over other trading nations, (Dornbusch, Fischer, & Samuelson, 1977). This classical trade theory, established in the 19th century, contends that when a country specialises in the production and trade of specific products for which it holds a comparative advantage, it leads to enhanced quality of the overall output of those products; whether for trade purposes or domestic consumption.

Effectively, such trade contributes to the overall welfare of the country. Recent research by Facchini, Silva, and Willmann (2013) supports this position, indicating that countries with specialised production patterns are more inclined to embrace trade liberalisation initiatives and subsequently benefit from reduced income inequality.

The theory of comparative advantage, rooted in the economic principle of opportunity cost, does not fully account for the intricate factors of production required for specialisation in the manufacture of specific goods. This has led to the increase in advocacy for economies to deviate from producing goods in which they hold a comparative advantage (Lectard & Rougier, 2018). Lectard and Rougier argued that developing nations can derive increased economic benefit through product diversification, and even further benefits by increasing the production of sophisticated goods with moderately refined value additions.

Given that the objective of the AfCFTA is to boost trade volume and promote the diversification of high-quality tradable products, the findings presented by Lectard and Rougier becomes increasingly important. Their study further reveals that product diversification is contingent upon the developmental stage of a country, with middle-income, technologically advanced, and resource-rich nations exhibiting a greater capacity for diversifying their manufactured and exported products. Conversely, lower-income countries face challenges in diversifying their product offerings effectively and should instead focus on retaining their comparative advantage.

2.4 Heckscher-Ohlin (H-O) Theory

The neo-classical trade theory of Heckscher-Ohlin (H-O) represents an evolution of Ricardian Comparative Advantage theory. The theory proposes that the scale of production and the specific traded products within an economy ought to be contingent on the relative abundance of the required factors of production (Deardorff, 1982). Additionally, this theory assumes that each country has fixed and identical access to primary factors of production.

While the H-O theorem has garnered significant acclaim and is widely regarded as a foundational pillar of trade theory, it has not been exempted from rigorous scrutiny over the years. Criticisms have centred around its inflexibility around identical production

capabilities and similar technologies across nations. It has also been criticised for its inherent oversimplification of the dichotomy of capital and labour. In certain contexts, the H-O theory has been inadequate with its use of universal price equalisation (Baskaran, Blöchl, Brück, & Theis, 2011).

Universal price equalisation, within the context of the H-O theory, assumes the prices and costs of production between countries remain the same. It considers prices and costs of labour, and working capital are equalised, especially between countries participating in a RTA. This assumption contributed to the weak empirical stance of the of the H-O theory, as it neglected the complexity of bilateral trade negotiations, dynamics of individual market structures and the actions of importers, exports and trading agents (Baskaran, et al., 2011).

The thorough and critical evaluation of the H-O theory over time has yielded notable advancements in its practical application, particularly by incorporating intricate trading networks into empirical studies (Baskaran et al., 2011). Drawing inspiration from the physical sciences, seminal contributions have introduced network and search perspectives to bilateral trade analysis, which prove valuable in understanding the patterns of multilateral trade within a free trade area such as the AfCFTA.

Rauch (1999) went on to present empirical arguments on network and search dynamics in trade, highlighting the increased trade volumes observed in commodity markets among economies with shared linguistic or historical (colonial) ties. Rauch's study employed a gravity model encompassing 63 countries across the globe. It consisted of 11 African countries, of which six were within SSA.

The countries from within SSA in Rauch's study were Ethiopia, Ghana, Kenya, Nigeria, South Africa, and Sudan. Similarly, this research report contains the countries of Ghana, South Africa, and Kenya within its sample. Furthermore, Baskaran et al. (2011) affirm via their research the distinct increase in trade that occurs when there is dispersion of both the product category and the countries involved in trade relationships.

As the AfCFTA emphasises the dismantling of trade barriers among its member economies, the application of the H-O theory becomes particularly relevant in analysing and understanding the production and trade dynamics within the FTA. This presents

valuable insight into the patterns and relationships that emerge among participating countries. However, it is essential to acknowledge the inherent limitations of the theory when applied to the complex multilateral conditions of a free trade area such as the AfCFTA.

The H-O theory's assumption of fixed and identical factors of production (Baskaran et al., 2011) may not fully capture the nuanced dynamics and diverse economic characteristics of the member countries. Therefore, while recognising the contributions and usefulness of the H-O theory, it is crucial to consider its applicability within the specific context of multilateral free trade agreements, and the subsequent ability to increase intra-African trade volume.

2.5 Imperfect Competition & Multinational Theory

2.5.1 Imperfect Competition in SSA

Economic theory introduced in 1962 brings to the fore that markets such as those found in Africa do not always operate in a situation of perfect competition. Indeed, most market structures across the world do not operate in the two extremes of perfect competition and monopoly structure. The theory of imperfect competition, introduced by Edward Chamberlin, encompasses a variation of market structures, where the conditions for perfect competitiveness of firms in the market are not all met (Chamberlin, 1962).

There exist key characteristics of imperfect competition within markets, which include the scale of control firms have over their products, and the respective product pricing, along with the degree of product differentiation within the markets. The number of active firms also contribute to defining the kind of imperfect competitive market structure at play.

Indeed, market structures that do not fit the model of a perfectly competitive market is cumulatively placed under the heading of an imperfectly competitive market (Roberts, 1989). Accordingly, imperfect competitive market structures, such as monopolistic competition, and monopolies, are typically observed across most markets (Helpman & Krugman, 1985).

The concept of perfect competition within markets describes an environment where demand for the products of a firm is perfectly elastic (Robinson, 1934). Such a structure anticipates firms to be able to enter and exit without any barriers, and although the firms may produce identical products, they are unable to influence the prices of their product, regardless of their market share. Thus, for firms to remain competitive in such perfectly competitive markets, they increase their product output to increase their market share, thereby effectively reducing the overall profits for all firms in the market (Neale & Weyl, 2017).

The AfCFTA secretariat prioritised four key sectors that are believed to increase private sector investment in Africa, and are expected to see rapid growth under a liberalised trade regime on the continent. The sectors are automotive, agriculture and agro-processing, pharmaceuticals, and transportation and logistics (World Economic Forum, 2023). These four priority sectors operate in markets that are far from perfectly competitive, particularly within the African context, and are expected to see high growth with increased liberalisation of trade.

[Imperfect Competition – Agricultural and Agro-processing](#)

The agricultural sector within the SSA region contains a broad spread of market structures, which are all imperfectly competitive in nature. This imperfectly competitive market structure is observed in an experiment conducted by Osborne (2005) in Ethiopia. Osborne's experiment found that wholesale grain traders in Ethiopia, who purchased agricultural produce from farmers for the purposes of inter-regional trade, were able to drive down the price of the produce by three percent. Such behaviours had an effect on efficiency in and trade distribution for agricultural trade.

Osborne's findings were more recently validated in Kenya, where the local agricultural market structure highlighted the low profit margins obtained by farmers in the country, albeit those consumer prices of the farmers products within the markets were relatively higher (Bergquist & Dinerstein, 2020). The experimental estimates observed from the work of Bergquist and Dinerstein revealed that imperfect competition structures between intermediary traders and farmers led to such traders earning a median profit markup of 39 percent. Their experiment demonstrates that such traders consistently work in a joint manner towards profit maximisation as part of their practice.

The findings in Kenya, by Bergquist and Dinerstein, were obtained through the implementation of three randomised control trials, focused on the degree of cost being passed through from farmers onto the wholesale purchasers, or traders. These trials showed the curve in demand for products and its derivatives from the farmers, and the effects of new traders entering the agricultural and agro-processing markets for the first time.

Bergquist and Dinerstein (2020) found that, whilst it is difficult to identify the costs and shocks experienced by bulk traders, they still enjoy a high degree of intermediary market power. The experiment showcased that, should traders price agricultural products at cost, total product surplus in Kenya would increase by 56 percent.

Indeed, the agricultural sector, and its related agro-processing sector, demonstrates the largely imperfect competitive nature of their respective markets in SSA, resulting in farmers making minimal profits on their yield, year-on-year. With such high levels of imperfect market structure, the AfCFTA protocol on increased trade within the Continent is aimed at reducing the costs of agricultural products, whilst encouraging farmers to have more direct access to consumers.

[Imperfect Competition – Automotive](#)

The automotive industry in many SSA countries remains highly uncompetitive when compared to other regions across the world. This was highlighted in the African Development Banks' working paper on the continents' automotive sector (Black, Makundi, & McLennan, 2017). The findings of the report indicate the low industrialisation position of many countries in the region, posing as a major problem for the automotive industry. Factors such as inadequate infrastructure, skilled labour, and easy access to finance have contributed to the weak industrialisation of the region (Bughin, et al., 2016).

As the automotive industry has been identified to improve the economic development of the region, the governments in some countries within SSA, have become directly involved in providing subsidies and/or investment programmes to foreign and local automotive vehicle manufacturing and assembly plants. This is observed in the South African Automotive Investment Scheme (DTIC, 2023) and the Ghanaian Automotive Development Policy (Ministry of Trade and Industry, 2023).

Whilst such government interventions are important in building domestic manufacturing capacities and capabilities, this also contributes towards the creation of an imperfect competition within the markets. The work of Black, Makundi, and McLennan (2017) highlighted the case of Kenya, where government policy supports automotive manufacturing and assembly.

In the report of Black, Makundi and McLennan, albeit the government policy on automotive was positive for the local industry, it stifled foreign imports into Kenya. Accordingly, Kenyan consumers paid higher prices for imports, especially when local manufacturing supply could not meet local and regional demand. The actions of the Kenyan government in this setting was protectionist in nature, although certain products would enjoy a reduction in tariffs for products that traders and subsidised manufacturers may require. The dichotomy of this balance is addressed by Cambazoğlu (2020) in relation to protectionist tendencies of governments, as they attempt to develop local industry.

Imperfect Competition – Pharmaceuticals

Similar to the agriculture and the automobile sectors, the SSA pharmaceuticals sector remains largely imperfect within SSA markets. A study focused on the impact of pharmaceutical tenders on prices in South Africa, found that from 2003 to 2016, the prices of pharmaceutical products publicly procured dropped by an average of 40% (Wouters, Sandberg, Pillay, & Kanavos, 2019). The study, albeit limited in scope to South Africa, found that, by virtue of public tenders publicly procured medicine costs were almost always lower than those sold within the private healthcare system.

Whilst a possible reason that led to high competitiveness on the pricing of medicines may be related to the high Herfindahl-Hirschman Index of the sector, it was also noted that the variation of firms that were securing the tenders has continued to become narrower over the same 14-year period (2003 – 2016).

This scenario is also observed across the rest of SSA, as shown in the research of Wouters et al. (2019). It is worth noting the reduction in variety of tender-winning firms for medicine supply to the public sector, which serves to demonstrate its imperfectly competitive nature. The implementation of trade liberalisation elements within the pharmaceutical sector could increase the number of firms competing within the sector,

under appropriate standards, however the dominance of existing firms may further narrow and limit the competitiveness of new entrants into the sector.

Imperfect Competition – Transportation & Logistics

The transportation services sector is globally considered oligopolistic in nature (Francois & Wooton, 2001). In SSA, this sector also retains its imperfectly competitive oligopolistic nature. In certain countries within SSA, the transportation sector is monopolistic, which limits the efficiency gains for sector in contributing to the broader economy. In 2020, the IMF recommended the reduction of Transnet, South Africa's state-owned enterprise, control on the maritime and railway sectors, which could possibly reduce the costs within the sector, and improve efficiency (Thakoor, 2020).

Shipping firms, trucking companies and forwarding agents are able to allocate resources and services based on their profitability or other preferences. Within the context of SSA, such firms prioritise their profitability, taking advantage of the imperfect market structure within the transportation and logistics sector. Where the market was operating under perfect competition, such a market would attract new entrants, who would take advantage of the low barriers, and be attracted by high profits (Thakoor, 2020).

Whilst the specific market structure composition may vary per country, they are mainly either oligopolies, or natural monopolies. The capabilities of institutions across the various countries in SSA, as well as intra-African institutions, would contribute towards either the reduction or increase of the firm's power in these respective markets.

Where the liberalisation of trade is balanced with the growth of firms, either domestically or by foreign investment, there would be an observed reduction in the market power of the firm. In contrast, should the liberalisation of trade lead only to increased exports, there would be an observed increase in the market power of firms that already dominate in the products of export (Abdu & Jibir, 2019).

The imperfectly competitive nature of the markets within SSA therefore provides an unfair advantage for multinational corporations (MNCs) and other large firms that have the capability to out-compete smaller businesses. These imperfectly competitive characteristics of markets in SSA would therefore have a significant effect on the gains of trade from any possible trade liberalisation initiatives (Francois & Wooton, 2001).

2.5.2 Multinational Company Theory

The rise of MNCs across the world has been born from the superior efficiency of firms that mastered their ability to transfer skills and knowledge across business units and geographies (Kogut & Zander, 1993). Whilst the existence of MNCs is not a reflection of the failure of market competitiveness, they (MNCs) are capable of capitalising on their home market experience and cross border trade capabilities to grow their competitive advantage.

Kogut and Zander's body of research on MNCs considered two conditions for the economic treatment of MNCs, namely comparative advantage, and firm internalisation of trade. The comparative advantage condition of the firm highlights their differentiation of production capabilities that allows the firm to specialise in economic activities such that they (MNCs) are able to render superior products or services. This allows the firms to engage in foreign direct investment in different geographies outside that of their home country (Kogut & Zander, 1993).

In an environment where trade liberalisation initiatives are robustly embraced, MNCs are most likely to increase their dominance in developing markets, especially by diversifying their products (Boehm, Dhingra, & Morrow, 2019). Firms diversification and differentiation of products are usually conducted in the context of the firms existing capabilities and knowhow, as these aspects are largely determined by the competencies of the firm, and not easily acquired (Sutton & Trefler, 2016)

The research of Sutton and Trefler, (2016) further qualified the comparative advantage of MNC firms and their ability to diversify by describing how the production capabilities of firms in any economy is largely determined by the comparative advantage and capabilities of the economy. Sutton and Trefler's theoretical consideration took into account two key elements. The first acknowledged that the quality of certain products produced by firms would be determined by comparative advantage. The second element highlights that, due to imperfect competition, especially in developing economies, the proliferation of lower-quality products would exist in order to increase the market share at a lower cost (Sutton & Trefler, 2016).

Kogut and Zander's second condition on internalising trade, is a position taken by firms to incorporate into their corporate structure, certain economic activities that may have been completed through external market participants (Casson, 2015). This increases the intra-corporation trade within the firm, across geographies. This is notably observed where there are comparative advantages for a firm to engage certain economic activities in particular geographies.

The concept of internalisation was developed in the 1970s as a theory by Ronald Coase, in an attempt to explain foreign direct investments (FDI) and the growth and spread of MNCs (Casson, 2015). The theory elevated the tactics of MNCs business activities undertaken in industries that required significantly higher knowledge intensity, and/or manufacturing components and raw materials the quality of which were difficult to control. As such, the concept of internalisation focused on the imperfections of products in markets where knowledge flows from research and development where not linked to production, and where there were constraints in the flow of components or raw materials across the production value chain.

It is prudent to take into account that multinational corporations have contributed an estimated 3% to the GDP of SSA, with a monetary value of US\$62.6 billion in 2022 alone (World Bank, 2023) A. This significant contribution to the GDP of nations in SSA is expected to increase, especially as liberalisation of trade between countries in the region is promoted. Whilst the liberalisation initiative on the continent may attract increased foreign direct investment, it could likely create an environment, where MNCs increase their internalisation of trade. Thus, the impression of increased intra-corporation trade between countries in SSA, may also be classified as increased trade volume between countries.

The combination of significant market power enjoyed by MNCs due to their size, their access to resources and cumulative comparative advantages, with the inherent imperfect market competitiveness within the region, is likely to further exacerbate the imperfect market conditions across the region (Antràs, Desai, & Foley, 2009). This further creates conditions that may increase the barriers of entry for new entrants into market sectors and industries, reducing the opportunities for the development of competitive, wholly-owned, domestic firms. In so doing, certain market sectors may continue to endure increased monopolistic competitive structures.

Even in the face of trade liberalisation within the SSA region, MNCs will largely dissociate their operational activities from the local value chains (LVCs), which may be underdeveloped to some degree (Ezeoha, et al., 2022). The limited integration of MNCs into the LVCs results in a steady increase in their reliance on global value chains (GVCs) for the needs of the MNCs local operations. Ezeoha et al., (2022) research in Nigeria, highlighted the importance of MNC integration with LVCs, which would support the inclusive development, technology spillover and the ability of local enterprises to access the international markets.

2.6 Dynamic Panel Data Analysis

In assessing economic phenomena over time, including the change in trade volume as other economic conditions such as trade liberalisation adjust over time, the dynamic panel data analysis have been noted to be adequate and more efficient in analysing panel data (Bun & Sarafidis, 2015). This analysis method is particularly suited in observing economic phenomena that spans a time-series and may have observations that are correlated and continues to be used in modern research studies on trade and economic growth (Epaphra & Amin, 2022; Teixeira & Queirós, 2016).

The seminal work of Anderson and Hsiao, (1981) introduced the two-stage least squares, also referred to as the general method of moments (GMM) which provided a solution to the endogeneity issue encountered within panel data analysis. Their method also bridged the gap in measurements errors and unobserved heterogeneity within panel data.

This method was further refined by the introduction of the system GMM by Arellano and Bover, (1995) which utilised the conditions of moments across the entire model in identifying the estimators that were invariant to the transformation. Their improvement provided alternative transformational options for instrument variables, thereby maintaining orthogonality across errors of the instrument variables (Arellano & Bover, 1995). This approach emphasized the use of lagged variables as instruments in addressing endogeneity and serial correlation.

In 1998, the system GMM was further improved with the work of Blundell and Bond, (1998) where they extended and popularised the system GMM method with additional

insights on the methodology of the model. The extensions introduced by Blundell and Bond addressed the concerns of excessive proliferations in instrument variables within the system GMM, when a limited time period existed. Their approach pushed for the use of both levels and differences of lagged variables as instruments (Blundell & Bond, 1998).

Whilst the use of the GMM and system GMM models have been shown to be adequate to assess the panel data, especially under the topic of increased intra-African trade volume, the application of fixed effects model allows for a robust analysis of empirical data. The fixed effects model accounts for unobserved individual heterogeneity, allowing the capture of characteristics of variables that remain constant over time as used in the work of Manwa, Wijeweera, and Kortt, (2019).

2.7 Literary Gap

The general literary consensus continues to support the benefits of regional integration and trade liberalisation for developing countries (Ngepah & Udeagha, 2019). This research reviews the core elements such as the theory of comparative advantage, which suggests that specialisation in goods of relative advantage enhances overall output and welfare. However, criticisms of the comparative advantage theory highlight the need for diversification and sophistication in product offerings. The H-O theory incorporates factors of production, partially taking into account the criticisms on comparative advantage, but its assumptions does not capture the complexities of multilateral free trade agreements.

As trade between countries in SSA continue to be guided by either one or both of the trade theories, the theoretical foundation influences respective national and regional trade policies and market structures. Such policies affect the manner in which MNCs operate in the country and region as a whole. As such, any drive to increase intra-African trade volume needs to take into account the imperfect market structures these MNCs operates in. By extension, any other local business would also face the same challenges as faced by the larger MNCs.

The extant literature reviewed in the sections above, whilst exhaustive, reveals certain gaps that warrant further review and empirical research investigation. Specifically, with

markets in SSA likely to retain its imperfections in competitiveness over the short to medium term, and as African states continue to drive for increased intra-African trade through liberalisation of trade, this research report finds insufficient evidence demonstrating the effect trade liberalisation has on increasing intra-African trade volume.

This gap in the library of literature is important, especially for MNCs that operate within the continent and SSA specifically. Companies and firms operating within the region across the AfCFTA priority sectors of agriculture and agro-processing, automotive, logistics and transportation and pharmaceuticals (Olayiwola, 2020), would be pivotal in the development and increase in continental trade, however it is critical for the gap in knowledge regarding the effect of liberalisation on intra-African trade volume to be bridged. Bridging this gap in knowledge would advocate additional evidence for MNCs and other private sector actors to further engage and develop firms within their LVCs (Ezeoha, et al., 2022).

This research report acknowledges that there remains multiple reasons explaining the slow growth in intra-African trade volume, such as geographic fragmentation, poor infrastructure, and internal political tensions (Ngepah & Udeagha, 2019). The use of a dynamic panel regression with system general method of moments within this research, introduces the ability to estimate and account for endogeneity across the selected data points, thereby better taking into account broad factors impacting trade growth. Furthermore, including models such as the fixed effect model, accounts for unobserved heterogeneity within the data, and uncovers any dynamic relationships in the data.

Recent research conducted by Afesorgbor, (2019) estimated that the impact of RTAs in stimulating bilateral exports within the African context proved underwhelming. Their empirical results showcased that, although there is general positive influence of RTAs on bilateral exports, the influence is not statistically significant. Afesorgbor's results are in line with other scholarly findings on this topic, which also approach similar conclusions, asserting the limited ability of RTAs in Africa to bolster bilateral trade.

Prior to the findings reported by Afesorgbor in 2019, the fifth edition of the joint publication on Assessing Regional Integration in Africa (ARIA), by the United Nations Economic Commission for Africa (UNECA), African Union Commission (AUC) and the

African Development Bank (AfDB), had underscored key observations, noting only a minority of African RTAs having yielded tangible outcomes in line with their stated objectives (UNECA, AUC, AfDB, 2012). The joint publication also highlighted the majority of African RTA had achieved largely underwhelming results.

Taking all the above factors into consideration, this reports assessment on the gap in knowledge, as to the effect of trade liberalisation in increasing intra-African trade volume is validated. Indeed, the extant academic literature has focused largely on the effects of trade agreements on economic growth, regional integration, or on poverty and inequality (Longo & Sekkat, 2004).

As the continent makes a concerted effort to liberalise trade relations across its economies through the AfCFTA, this void in the available literature is important in order to grasp the consequences trade liberalisation will have for increasing intra-African trade volume. Even more specifically, the gap in literature has led to the shrouded nature of the trade liberalisation variables that would have a positive effect on increasing intra-African trade.

Chapter 3 – Research Question

The existing literature on this topic, whilst robust in nature, has assessed the various combinations of trade liberalisation, and its effects on developing nations. The literature has centered on the effect of trade liberalisation on economic growth (Yameogo & Omojolaibi, 2021; Ngepah & Udeagha, 2018). Other areas of literature in this regard focus on the impact of liberalisation on poverty (Anderson E. , 2020) in developing nations.

As such, this research focused on closing the literary gap on the relationship trade liberalisation has on increased intra-African trade volume. Accordingly, the research question (RQ) of this report is as below:

RQ: How does trade liberalisation impact intra-African trade volume?

This research considers trade liberalisation as those policies and actions taken by a nation to reduce the challenges faced by firms to engage in international cross-border trade (Alam & Sumon, 2020). The actions and policies considered as trade liberalisation within the scope of this research include the index of trade freedom, cost to trade, logistics performance index, and trade openness. GDP per capita provides some insight into the economic productivity of the countries within the research sample.

This research question is pertinent, as the empirical findings obtained from this research report contributes towards government policy discussions and negotiations among African states on present trade liberalisation initiatives and the AfCFTA. The findings also inform the actions and future investments by private firms, and MNCs, operating in SSA.

The answer to the research question would provide insights into one of three possibilities. The first possibility was that trade liberalisation may have a positive, statistically significant effect on increased intra-African trade among countries in SSA. This would indicate that, as a country within SSA increased trade liberalisation initiatives, it would see a marked increase in trade volume with other SSA countries. Such a finding would reinforce the need for states to pursue the actions required to sustainably achieve liberalisation objectives.

The second possibility was that trade liberalisation may lead to a negative, statistically significant effect on trade volume among SSA countries. Such an outcome would imply that as trade liberalisation initiatives increase, there would be an observed decrease in intra-African trade volume by any given SSA economy.

Such a situation could potentially occur where increased liberalisation initiatives holistically reduce the competitive advantage of industries and firms within the SSA region, thereby leading to a decline in exports. Such an outcome would raise significant economic and trade policy concerns on the effect of liberalisation initiatives among African states.

The third possibility was that trade liberalisation may have no significant effect on increased intra-African trade volume, and in such a setting, the research would present no discernible effect of liberalisation on the increase in intra-African trade volume. Where such an outcome was observed within the research findings, consideration of possible non-linear effects ought to be considered for further studies.

The answer to the research question would guide the recommendations for all future research under the topic of trade liberalisation in SSA.

Chapter 4 – Methodology

The research design follows a descripto-explanatory approach. By analysing data obtained from the World Bank, the research sought to provide insights into the research question. Using a combination of descriptive and explanatory research strategies, the research presents sufficient findings to interpret details pertinent to the region.

A descripto-explanatory approach combines both the descriptive and explanatory research approaches to obtain insightful inputs into the research topic. The choice of a descriptive research approach allows for the accurate description of key terms and realities relevant to the topic of trade liberalisation and its effect on intra-African trade volume. The descriptive research approach also supports defining trade liberalisation and increased trade growth in Africa, especially under the headings of trade creation, and trade diversion.

The application of an explanatory research strategy allows for the findings gleaned from the initial descriptive approach to be elevated, in assessing correlations and other relationships that may exist, whilst explaining the reasons for such occurrences. Such a combination of approaches is highlighted in the work of Saunders and Lewis (2018), as having significant benefits. Recent literature in this field also applied such combined approaches, and can be observed in the research of Erten, Leight, and Tregenna, (2019).

The philosophy guiding how knowledge from literature, and data obtained from the world bank database, informs the outcomes of the research will be based on the epistemological perspective on positivism. The choice of using this philosophy is based on the nature of the previous research work done on this topic, which is conducted by various researchers (Erten, Leight, & Tregenna, 2019; Portugal-Perez & Wilson, 2009). As their epistemological assumptions would necessarily vary due to different contextual paradigms, the consequent research outcomes observed also vary.

Epistemological assumptions are structured according to the manner in which people communicate and digest extant knowledge (Becker & Niejaves, 2007; Saunders & Lewis, 2018). Positivism is a scientific research philosophy that seeks to find explanatory relationships for variables that could be used as generalisations. This means that the

research method applied on the acquired data, can consequently be replicated (Park, Konge, & Artino, 2020). The ability to replicate the findings of this research with a positivist philosophy, is an outcome of the philosophy's scientific model of identifying theory from literature, generating a hypothesis, and determining the relevant variables for the study, upon which experimentation is conducted. The findings of this research is then discussed in a conclusion that is both easily communicated and understood.

The research sought to ascertain details on how trade liberalisation in Africa may increase intra-African trade. With the wealth of research already existing, and various academic theories proposed, this study followed a deductive research approach. The deduction approach is one that seeks to empirically test the theoretical positions of prior literature (Saunders & Lewis, 2018).

The choice of this approach allows for further insights to be unravelled from the literature, allowing these insights to be tested. A particular instance this research sought to further delve into, was the estimation of Ngepah and Udeagha (2019), who argued that significant benefits of trade is achieved when multiple countries are engaged, and barriers to trade, such as tariffs, are dismantled.

A mono-quantitative research method was applied within this research report, which relied on a single method of obtaining and analysing data, allowing the research to be completed within a limited timeframe. It is also noted that this method was straightforward, and a holistically intuitive research method.

The strategy chosen for this research topic was an experiment as detailed by Saunders and Lewis (2018). Using an experiment allowed the research to identify relationships that existed between the key variables considered, and to further define what effects and outcomes certain independent factors would have had on corresponding dependent variables. The choice of this strategy is due to its ability to provide deep insights into the research question highlighted above.

Other research studies conducted in this field also used experimentation as a strategy to garner further insights into this topic. This is observed in the work of Alhassan and Payaslioglu (2020), where an experiment using the gravity framework in the Poisson

pseudo-maximum likelihood with high-dimensional fixed effects (PPMLHDFE), was used to assess the effect of state led institutions on bilateral trade in Africa.

The time horizon selected for this research was longitudinal in nature. As this research sought to unravel the effect of trade liberalisation on increasing intra-African trade volumes, the longitudinal approach was identified as best-suited for the required observations. This longitudinal study was based on the collection of data from secondary sources that stretches across a period of at least 10 years, allowing for the data to inform the changes over time. Albeit the case that longitudinal time horizons are typically not used for academic research studies that are expected to be completed within one year, it is proven to be possible in such case where the data for such research is obtained from secondary sources (Saunders & Lewis, 2018).

4.1 Research Methodology

This section of the research looks to detail the procedures, techniques, and analytical steps that were used to garner insights prompted by the research question. This section begins by defining the population of the study, as well as the control measures. It also includes the methods of ensuring quality and validity of the research findings, including the limitations of this academic study.

4.2 Population Choice

This study builds on the insights of previous literature, and has identified the countries of SSA as its population. As this study seeks to contribute to the trade liberalisation body of knowledge, the choice of this population adds a new angle on available findings to support existing literature on the topic of trade liberalisation and intra-African trade. Previous academic research in this field, such as the work of Longo and Sekkat, (2004), used a population choice of 41 African countries, and sought to assess those economic and political policy obstacles that have a significant impact on intra-African trade.

The population considered in Longa and Sekkat's academic research pertain to countries where the required dataset was readily available. Similarly, this research proposal seeks to analyse African countries that are signatories to the AfCFTA, as the population for the research. The data obtained from these countries will be numerical, and is expected to be continuous in nature. As the data is analysed over a longitudinal

timeframe, an appropriate time series analysis will be applied, considering at least two dimensions (Hsiao, 2007).

4.3 Unit of Analysis

The units of analysis refer to the fundamental elements of the research study (Ritella, Rajala, & Renshaw, 2021). For this research, the unit of analysis was for individual countries within the population highlighted, with a focus on the change in the country's gross merchandise trade with low-and middle-income economies in SSA over the period. As the unit of analysis is not limited to a natural person, organisation, or any given incident, where the choice of selecting the volume of imports and exports from the above-mentioned countries is tenable. These units allow the research to maintain a relevant scope for the quantitative experiment to be executed. This research only focused on measuring formal trade as data for informal trade is limited and cannot be corroborated easily.

4.4 Sampling Size and Method

The sample for the research was selected from the population highlighted above; the countries in SSA that are signatory to, and have deposited their instruments of ratification on the AfCFTA to the African Union Commission. These are 41 in total (Tralac, 2023). However, as the research's unit of analysis is on a country level, further selection of the sample was based on countries that have had a trade-to-GDP ratio above 50% at least twice in the 10 years under review. The sample also considered and prioritised countries with complete trade data.

In effect, the final sample size from the research is expected to be less than the full population. This position is highlighted in the business research guide of Saunders & Lewis (2018), which raises the impracticability of collecting data from an entire population; particularly for academic research projects.

The sampling frame for this research consisted of the complete 41 countries, based on the country data being made available on intergovernmental databases such as the World Bank online database. Accordingly, a probability sampling technique was applied to determine the final sample and sample size for the research. Probability sampling

techniques constitute a selection of statistical techniques that are useful for determining the choice of a sample from a sample frame.

The technique allows for all members of the population to have an equal chance of being selected as a part of the sample, with no influence of the researcher's discretion (Saunders & Lewis, 2018). This is further supported in other research articles that reinforce the benefits of using probabilistic methods in selecting participants of the sample (Etikan, 2017).

In using probability sampling techniques to determine the research sample, the research adopts simple random sampling. This is a technique that allows each member of the sample frame the chance to be selected for the final research sample (Saunders & Lewis, 2018). In using this technique, an estimated final sample size of 10 SSA countries was selected from the entire population.

Access to the sample was obtained from the World Bank's online database (World Bank Group, 2023), which stores up-to-date macroeconomic country data for all countries in the population. Access to the database is open-source, allowing for free and easy access to the data, and the opportunity for replication of the experiment conducted in this research.

4.5 Measurement Instruments

As this research sought to unpack the effect of trade liberalisation in increasing intra-African trade over a 10-year period, a dynamic panel data analysis is run in order to analyse the data. This model is sufficiently robust in analysing data that demonstrates both time-series and cross-sectional dimensions (Teixeira & Queirós, 2016). The dynamic panel data model takes into account the dynamic nature of the data obtained from the 10 sample countries within this study; including prior observations of the dependent variable.

Dynamic panel regression models, also referred to as generalised method of moments (GMM) is an appropriate choice for analysing panel data such as that within the sample data set, as this modelling technique allows the capture and analysis of both time-series and cross-sectional data variations within the dataset (Arellano & Bond, 1991). The modelling technique argues for the inclusion of lagged dependent variables in the data

analysis, as these capture explicit dependencies within the data acquired. As this research is based on economic data, this model is appropriate due to the outcomes of economic data often being influenced by past performances.

Among the key challenges faced in estimating panel data, is the concerns of endogeneity, which occurs when the independent variables of the data are shown to have a high correlation with the error term (Arellano & Bond, 1991). This issue leads to inconsistent and often biased estimates in the data analysis. It is for this reason the use of a dynamic panel regression model within this research is highly appropriate.

Ensuring a robust analysis on this research topic required additional models to also be brought into consideration, including the system GMM. The system GMM extends the standard GMM model by simultaneously utilising the conditions of moments from both the difference and system modelling equations (Roodman, 2009). The introduction of this technique ensures the challenges of weak instrument variables that may be selected whilst conducting this research, along with the overfitting of such instruments with endogenous variables are addressed. These challenges are often observed within panel data that has a limited time period such as 10 years, as in the time horizon of this research.

It is also worth noting that the challenge of autocorrelation, which is often observed within dynamic panel data regression models is addressed using the system GMM. Autocorrelation occurs when the error terms within panel data regression across different time periods are correlated with each other. This effectively leads to the estimates of the model parameters being deemed inefficient, thereby raising validity concerns of any inferences from the model (Blundell & Bond, 1998).

Finally, this research also included the fixed effect model, which is valuable in dealing with any unobserved heterogeneity across country-specific variables, that remain constant over time. The inclusion of the lagged variables within the fixed effect model allows the research analysis to capture the effects of past observations whilst controlling for any country specific differences (Sul, 2019).

The broad dynamic panel data estimation models used, allowed the research to unravel complex relationships from the sample data, whilst factoring in time-dependent effects,

and controlling for possible endogenous biases within the dataset. This modelling techniques are an extension of the standard panel data regression model, and is better at expressing significant relationships between various variables in increasing trade volume (Saunders & Lewis, 2018).

4.5.1 Dependent Variable

The dependent variable of a regression is the factor that is influenced by the independent variable (Kothari, 2004). As such, this research considers its dependent variable for the data analysis to be the gross merchandise trade volume with low-and middle-income countries in SSA. The indicator from the World Bank database that is used to measure effect of trade liberalisation on increased intra-African trade will be the change in Gross merchandise trade with low and middle-income economies in Sub-Saharan Africa.

The selected measure for the dependent variable is adequate, as it showcases the change in trade volume with other SSA countries, as liberalisation initiatives take place over the years. This variable brings to light the trade relationships within the SSA region, summarising the dynamics of cumulative trade flows among countries within the geographic area. Analysing the effectual changes of this variable over a 10-year time period, allows this research to identify the independent levers that significantly contributed, positively or negatively, to these changes.

Indirectly, the use of the gross merchandise trade volume as the dependent variable allows policy makers, governments and future researchers involved within the topic of trade liberalisation in increased intra-African trade, better understand the factors and variables that influence the flows of trade between countries in SSA. Indeed, the choice of the gross merchandise trade as the dependent variable offers a comprehensive lens to empirically understand the factors that influences its growth or contraction.

The data of the dependent variable is obtained by calculating the sum of imports and exports in merchandise trade in SSA. The data is sourced from the World Bank database which provides a country's merchandise imports and exports, as well as the respective percentage of merchandise trade with countries in SSA (World Bank Group, 2023).

4.5.2 Independent Variables

The independent variable, according to Kothari, (2004), is the factor that is considered significant in influencing the outcomes of the dependent variable. It is possible for any one dependent variable to have multiple independent variables, and as such, this research will consider five independent variables, all of which are accessible from the Heritage Foundation and the World Bank database.

The variables that are selected as the independent variables are based on the factors within this research which are considered to define the structure of trade liberalisation. Accordingly, this research considers trade liberalisation to be the combination of actions taken by a nation to increase their participation in global trade (Wacziarg & Welch, 2008). These include, the reduction of the barriers to trade, reduction of tariffs and costs to trade, efficiency in logistics infrastructure, domestic productivity and openness to trade of the nation as a whole.

Based on the above, the first independent variable considered is the Index of Trade Freedom, which is a subset of the Index of Economic Freedom published by The Heritage Foundation (The Heritage Foundation, 2023). The Index of Economic Freedom is a broad policy index that maps the economic advancement of countries based on 12 sub-indices annually. These include property rights, trade freedom, and financial freedom.

The trade freedom sub-index follows a five-point scale in quantifying an economies restriction to international trade, following a framework similar to the tariff portion of the IMF's Trade Restrictiveness Index (IMF, 2005). The index quantifies factors such as tariffs, and trade facilitation performance, and measures the degree to which tariff and non-tariff barriers impact the imports and exports of goods to and from a country (Cabello, Ruiz, & Pérez-Gladish, 2021).

The second independent variable to be considered will be the Cost to Trade. This variable is obtained by calculating the sum of the costs to export goods, with the costs to import goods. It also includes the sum of the costs incurred by traders to ensure border and documentary compliances are met, in line with the respective country's customs and government agency regulations (World Bank, 2023). These costs take into account

the costs of mandatory shipment inspections, time costs for customs clearances, and documentary handling costs from origin, transit, and destination countries.

The third independent variable selected is the Trade Openness of the countries in the sample. This indicator is represented as Trade (% of GDP) and obtained from the World Bank database. It showcases the summed value of exports and imports of goods and services within an economy, as a fraction of that economy's GDP (World Bank, 2023). Trade openness is a favourable variable to use in the methodology, as it is commonly used within academia to represent the sentiment of an economy to engage in global trade (Wang, Wang, & Li, 2023).

The fourth independent variable applied in this study is the GDP per capita for the countries in the sample group. The GDP per capita value is a critical component of the empirical assessment, as it captures the trajectory of economic growth over the time-series in the sample set (Burange, Ranadive, & Karnik, 2018). The inclusion of GDP per capita into the empirical model allows the model to factor in the productivity of the economy's industry and workforce, based on resources available.

The fifth independent variable included in the empirical model for the study is the Logistics Performance Index (LPI), as obtained from the World Bank's database. As this research sought to unravel conditions that lead to increased intra-African trade, the inclusion of the LPI was necessary. The LPI, introduced by the World Bank in 2007, measures the performance of countries in terms of logistics and the country's capabilities. The index analysis the capabilities of a country on a range of factors, including quality of transport infrastructure, ability to track and trace consignments, and efficiency in customs clearing processes (Rezaei, van Roekel, & Tavasszy, 2018; Marti, Puertas, & Garcia, 2014).

The combination of the five independent variables highlighted above, namely index of trade freedom, cost to trade, trade openness, GDP per capita and the LPI, are cumulatively considered in this research report, as the factors that influence trade liberalisation in the sample country.

4.5.3 System Generalised Method of Moments

The dependent variable of gross merchandise trade with low and middle-income countries, was considered to possibly have an effect on the independent variables, and vice-versa. This would indicate a bilateral causal relationship, and a possible inverse relationship between the six variables, raising the inevitable concern of endogeneity bias (Arellano & Bond, 1991). In mitigating such endogeneity bias, the research relied on the proposal of Arellano and Bond, in integrating the generalised method of moments conditions (GMM).

The concept considered within this research factored in the elimination of individual fixed effects, using a first difference regression equation, thereafter exchanging the lagged variable to become an instrument of endogenous variables within the GMM model (Teixeira & Queirós, 2016). In this setting, the GMM residuals are further analysed within a Sargan test to overidentify possible restrictions in the panel regressions (Kiviet & Kripfganz, 2021), and further associate variables with simple estimators as introduced by Anderson and Hsiao (1981).

4.6 Data Gathering Procedure

The data for the research is based on secondary data, collected from the open-source World Bank Open Data platform (World Bank Group, 2023). The data collected was focused on the entire population size of 48 countries from the SSA region, with 1,442 data indicators extracted. The extracted data points includes data that cuts across social, economic, environmental, and institutional topics. The data was then narrowed down, using the probability sampling procedure on the sample frame.

4.7 Data Analysis Approach

The obtained data is analysed in a combination of ways before final interpretation. The objective of the research is to answer the central research question, to which end the following analysis is conducted:

Descriptive Statistics: The key features of the dataset are summarised and presented in a tabular format, allowing for an initial high-level view of the data obtained. This includes details such as the overall averages of the various datapoints across the time-series.

Correlation of Variables: There was then a review of the degree to which the selected values in the dataset share a correlation with each other. A strong correlation between the values would indicate that the selected dependent variables are impacted by the independent variables. The application of a multicollinearity test was introduced to ensure robustness of the empirical analysis.

Dynamic Panel Data Analysis: The use of a dynamic panel analysis was particularly useful for analysing the data, taking into account its longitudinal nature (Hsiao, 2007). In so doing, the analysis of data which had two dimensions, one being a cross-sectional contextual dimension and the other being a time dimension was ideal. The use of the panel data analysis is critical to this research study as it allowed the observation of changes for each country in the sample over time, and simplifies the computation of the data.

4.8 Data Quality Controls and Limitations

A potential limitation of endogeneity bias, where the selected independent variable from the dataset has a causal relationship with dependent variable was taken into account (Hsiao, 2007; Wooldridge J. M., 2010). To ensure quality of the data, the decision to introduce a multicollinearity test was found appropriate to identify whether any such causative relationship existed.

A further limitation to the study is the imperfect execution of trade liberalisation initiatives of each country within the selected samples (Blank, Egger, Merlo, & Wamser, 2022). As the research did not factor in the realities of political and civil conditions in the countries, this limitation may raise the requirement for further research using advanced econometric models for deeper insight. Econometric analysis in the form of using Computerised General Equilibrium models could further test the validity of this research findings, factoring in the executions of trade policies in respective countries.

This research findings is further limited by the effects of structural and institutional barriers to trade among African nations (Hatzenbuehler, 2019). The effect of structural barriers to trade are reflected in the imperfect development and management of product markets within the continent. This directly impacts the competitiveness of African value-added products vis-à-vis imported products from outside the Continent. In addition to

structural limitations, institutional barriers, such as changes to trade regulation, or the introductions of taxes, duties, or other trade-related policy, also presents a limitation to this study.

Another key limitation of this research is its inclusion of the trade volume generated from the economic activities of MNCs in SSA. This limitation takes into account the increased possibilities of intra-industry trade between large and MNC firms that adopt increased internalisation of operations. Under this limitation, the information utilised in the analysis did not separate the volume of trade contributed by internalised operations of MNCs, or any other intra-company trade volume across the time series.

Finally, the limitation of data selection from only two sources, the World Bank Open Database, and the Heritage Foundation's database, increases the chances of not obtaining all data points from the countries in the selected sample. However, the rigour and structure of reliability granted to the World Bank and the Heritage Foundation, allows the data to be openly cross-checked.

Chapter 5 – Research Findings

This chapter showcases the findings from the panel data across the 10 sample countries of Botswana, Cameroon, Côte d'Ivoire, Gabon, Ghana, Kenya, Rwanda, Senegal, South Africa, and Zambia. The data obtained from the databases of the World Bank and the Heritage Foundation was secondary in nature, over a 10-year time span. The data took into account six key independent variables, namely: gross merchandise trade with low and middle-income economies in Sub-Saharan Africa (gross merchandise trade), as the dependent variable, and the index of trade freedom, cost to trade, trade openness, GDP per capita, and the logistics performance index, as the independent variables.

The data obtained was restructured into a framework that allowed for a detailed analysis to be conducted using the statistical software R (The R Foundation, 2023). As the fundamental purpose of the research was to identify the relationship between trade liberalisation and increased intra-African trade volume, the above listed independent variables, were associated with the factors that constitute trade liberalisation. Intra-African trade volume was viewed within the scope of the dependent variable highlighted above.

The specific research question considered was, How does trade liberalisation impact intra-African trade volume?

The sub-sections that follow herein showcase the findings from the data analysis.

5.1 Descriptive Research Statistics of Sample Panel Data

Table 1 below showcases a descriptive summary of the cumulative panel data obtained and analysed for the 10 sample countries in SSA. The summary of the data spans the 10-year time series under assessment within this research report. The data presented within the table also highlights the cross-sectional nature of the data. As the data presented in the table is intended to only show a descriptive summary of the data analysed under this research, the numerical values shown over the time period represent averages under the respective variables.

The data summary shows all variables of the data to be complete, however, it was noted that the data was holistically imbalanced. The cost to trade values for 2010-2013 for all

countries was unavailable from the dataset. This is due to the value for the cost to trade not being calculated by the World Bank in those years. The research noted this limitation, and proceeded to use the data nonetheless, as no other similar estimations were readily available.

Table 1 – Panel Data of sample countries in SSA (2010 – 2019)

Country	Average of Gross Merchandise Trade SSA (current US\$)	Average of Index of Trade Freedom	Average of Trade Openness	Average of Cost of Trade	Average of GDP per capita (current US\$)	Average of Logistics performance index: Overall (1=low to 5=high)
Botswana	6,534,899,911.12	79.89	101.66	660.46	6,542.17	2.75
Cameroon	1,966,198,499.25	57.17	45.86	3,544.13	1,494.47	2.43
Côte d'Ivoire	5,895,998,185.27	71.13	55.40	1,281.06	1,967.27	2.74
Gabon	525,243,532.29	60.30	80.58	3,223.67	8,253.45	2.26
Ghana	4,887,759,396.39	65.69	73.92	1,671.86	1,848.03	2.57
Kenya	3,536,043,396.56	67.39	43.14	1,280.50	1,490.01	2.79
Rwanda	960,500,558.61	73.87	46.63	738.45	717.46	2.61
Senegal	2,182,087,424.80	72.01	58.70	1,889.39	1,367.45	2.51
South Africa	35,970,870,675.27	76.04	55.38	2,055.33	7,178.86	3.54
Zambia	6,390,978,009.87	79.57	74.90	1,125.00	1,520.53	2.40

The dataset unveiled particular insights into the dynamics of trade between the countries in the research sample, especially certain economic conditions. Quite notable is the positions of South Africa, Botswana and Zambia, showing a higher than average gross merchandise trade value than the other countries in the sample. Gabon and Rwanda records the lowest trade activity with other countries in SSA.

The index of trade freedom vertical also showed that Botswana and Zambia enjoyed the highest levels of trade freedom, inferring both countries embodied business environments that allowed ease of trade. Cameroon displayed the lowest trade freedom score, highlighting the existence of restrictive trade conditions.

The openness to trade is most prominent in Zambia, Ghana and Gabon, showcasing the contribution of global trade to the economies of these nations. Botswana is the one country within the sample set that had an average trade openness score above 100%, indicating trade contributes more to the GDP of the nation than any other domestic

activity. Cameroon's particularly low openness to trade underscores its relatively insular trading environment.

Additional insights from the descriptive analysis shows the cost to trade is relatively low in Botswana and Rwanda across the sample set, with Gabon and Cameroon showing the highest costs to conduct trade. This seemingly is interlinked with the lower trade freedom ranking of both countries. Furthermore, the economic position based on GDP per capita of South Africa is flagged as the highest across the sample countries, whilst Rwanda touts the lowest GDP per capita. However the broad spread of the GDP per capita of each country within the sample mainly displays, is the economic disparity of the countries, indicating the existence of increased trade and income imbalances among the countries.

Finally, the logistics performance scores of South Africa confirms it has the most sophisticated and well developed logistics infrastructure among the sample set. Conversely, the scores of Senegal and Gabon highlights the infrastructural and system challenges in logistics faced within both countries, possibly leading to major bottlenecks within their respective supply chains.

As the above descriptions are largely only at surface level, the below sections provides a deeper analysis into the relationships these variables hold in increasing intra-African trade.

5.2 Data Visualisations

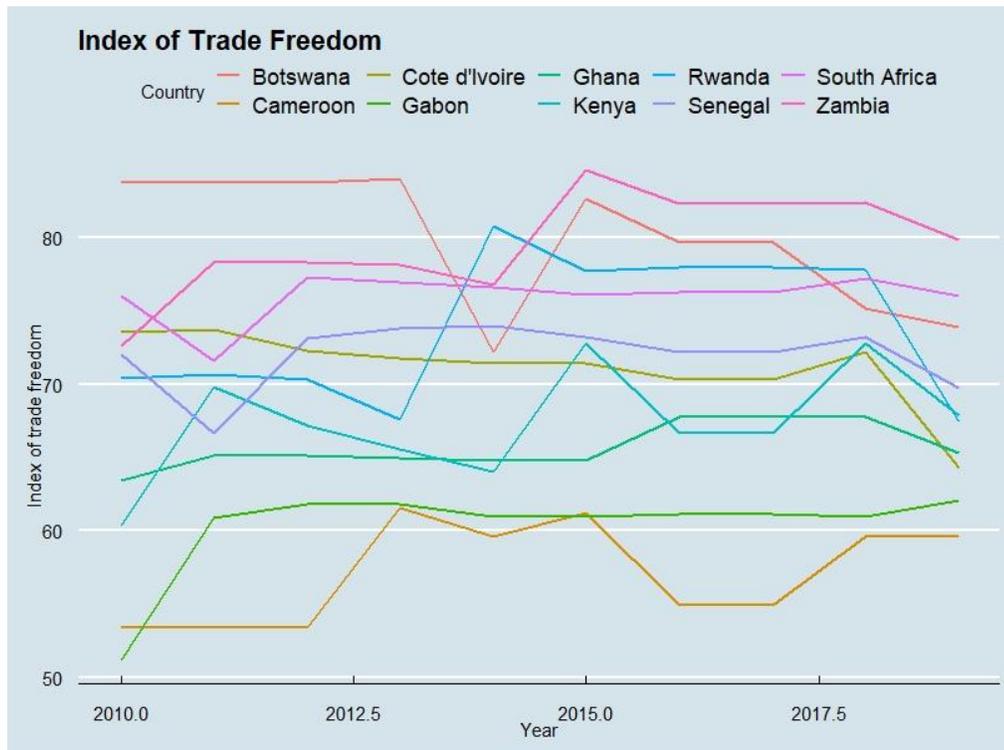
In assessing the independent variables within this research, a visualisation of each variable was generated, showcasing the performance of each country within the sample set, vis-à-vis other countries within the group. The visualisations take into account the 10-year time series across the sample countries, as shown below.

5.2.1 Index of Trade Freedom

Figure 2 below represents the data visualisation of the index of trade freedom, plotted for each country within the research sample. Countries that place higher on the index are perceived to have an increased freedom of trade across the years. The data visualisation notes that all countries within the sample group have a minimum trade freedom index above fifty.

The countries with the highest average over the 10-year period under research, are observed to be Botswana, Zambia, and South Africa. Cameroon, Gabon, and Ghana are observed have the lowest average index across the time-series. It is observed that, over the research period, whilst most countries saw fluctuations in their index of trade freedom, their results have remained relatively flat.

Figure 2- Index of Trade Freedom



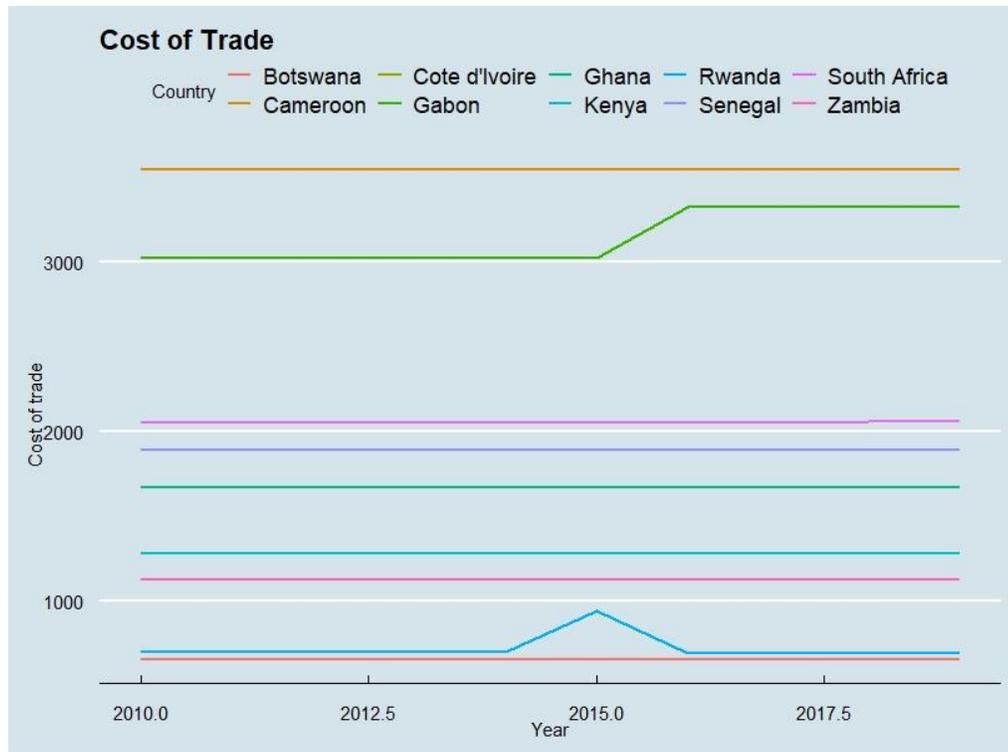
5.2.2 Cost to Trade

Figure 3 plots a visual representation of the cost to trade across all countries within the sample group. The cost to trade is represented in United States Dollars (USD), and provides an overview of the general cost incurred by traders within each country in compliance with documentary and border regulations to import and export merchandise. The data considered in the plotting is the gross cost for both import and export.

From the sample countries, Cameroon and Gabon are shown to carry the highest cost to trade, with traders in these countries paying over USD3,000 to complete the required border and documentary regulatory procedures. Rwanda and Botswana both displayed the lowest costs to trade, with traders in both countries paying below USD1,000 to

complete the required border and documentary regulatory procedures. The costs to trade for all other countries ranged between USD1,100 to USD2,055, over the 10-year time series.

Figure 3 – Cost to Trade

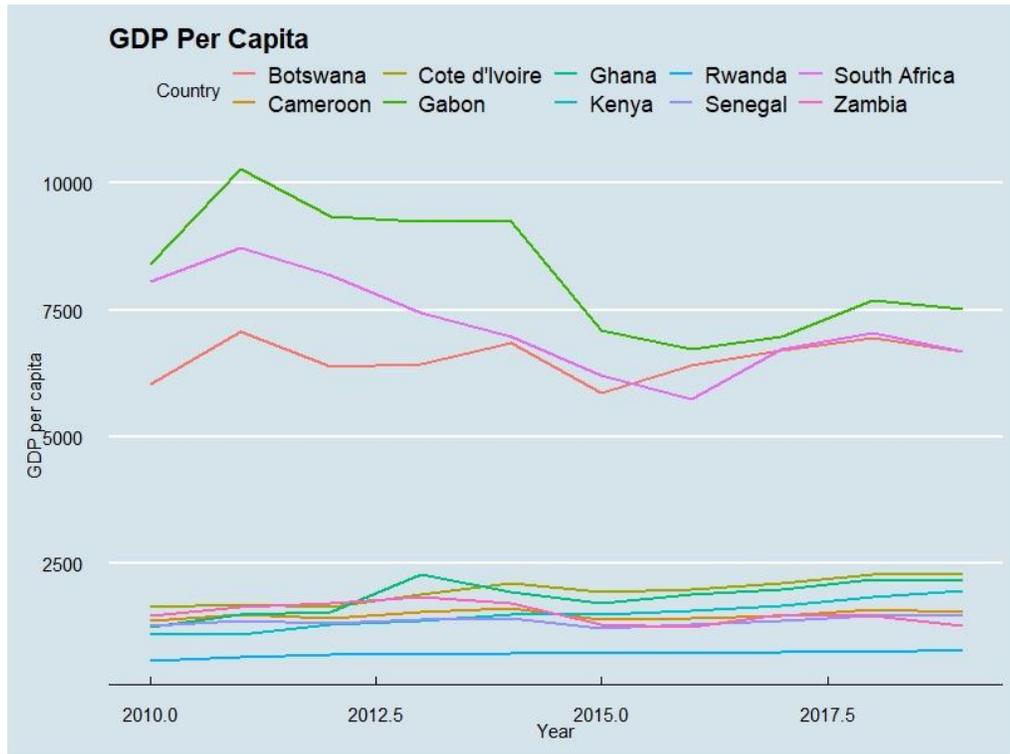


5.2.3 GDP per Capita

Figure 4 presents the GDP per capita of each country within the sample group. The GDP per capita value is computed in USD over the years under review. The initial findings based on the data highlights the countries with the highest GDP per capita over the time period under research are Gabon, South Africa, and Botswana.

Whilst each of these three above-mentioned countries have maintained an average GDP per capita of USD8,253, USD7,178 and USD6,542, respectively, over the 10-year time period, all other countries within the sample group have a per capita value that is below USD2,000. Rwanda is noted to have the lowest GDP per capita vis-à-vis the rest of the sample group.

Figure 4 – GDP per Capita



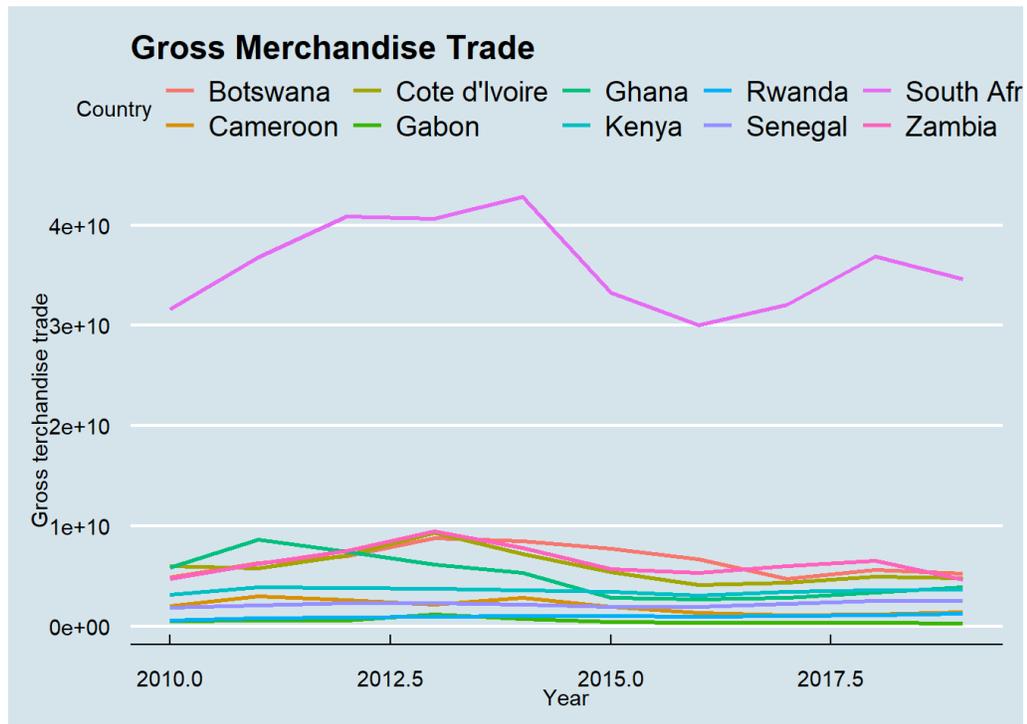
5.2.4 Gross Merchandise Trade

Gross Merchandise trade, the stated dependent variable for this research, is plotted in Figure 5 below. The x-axis of the plot showcases the USD value of merchandise trade engaged by each country, in the scientific notation format. The use of this format is due to the large numbers in the dataset.

The analysis show that, South Africa, by far outpaces other countries within the dataset in merchandise trade value. South Africa’s merchandise trade value averaged USD36 billion over the 10-year time period under assessment, with a peak in trade value in 2014, where gross merchandise trade was USD42.8 billion.

Gross merchandise trade year-on-year, for all other countries within the sample group over the 10-year time period was less than USD10 billion. Gabon is noted to have the lowest trade in merchandise across the sample countries, with an average trade value of USD525 million over the time series, with the peak trade value observed in 2019, where gross merchandise trade was USD1.2 million.

Figure 5 – Gross Merchandise Trade



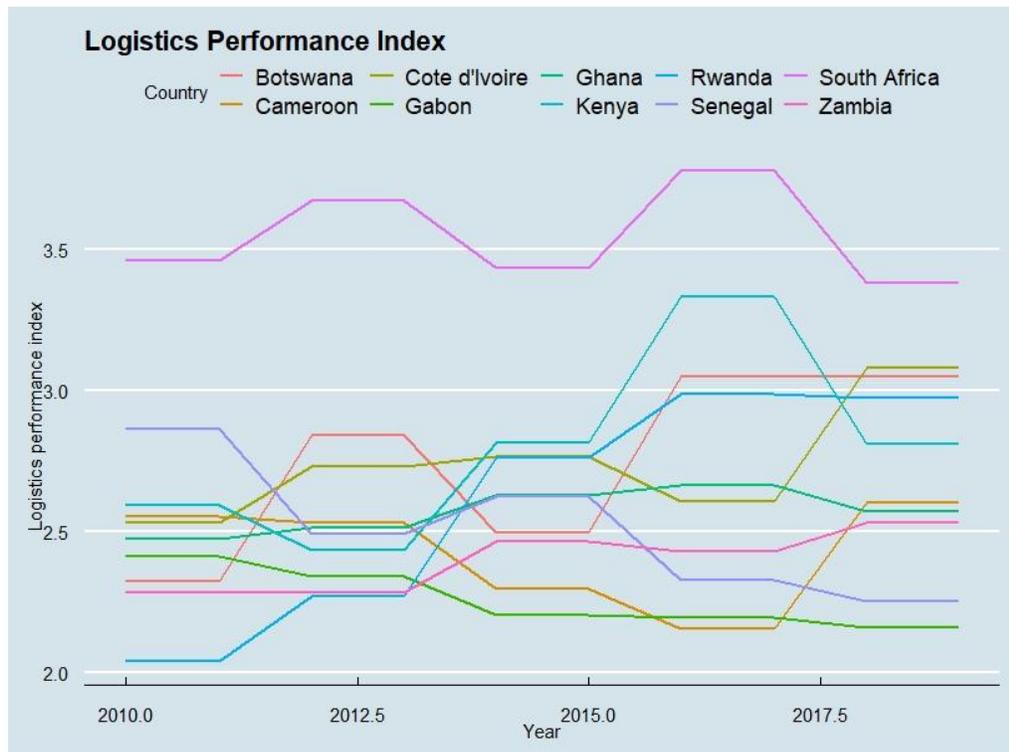
5.2.5 Logistics Performance Index

Figure 6 below shows the plot for the Logistics Performance Index of all countries within the sample group. On a scale of 1–5, the LPI serves as a metric of how well established a country’s logistics and supply chain system is and how intricately it works, with 1 indicative of a low performance, and 5 indicative of a high performance. The LPI analysis earmarks South Africa’s highly intricate and established logistics and supply chain infrastructure with an average LPI score, over the 10-year time series, at 3.5 out of a total score of 5.

The average LPI performance of all other countries within the group are markedly within the range of 2.0, with Botswana having shown the most consistent improvement in LPI

performance over the years. Botswana’s observed improvement on LPI from 2.3 in 2010 to 3.05 in 2019, with observed and noted.

Figure 6 – Logistics Performance Index



5.2.6 Trade (% of GDP) – Trade Openness

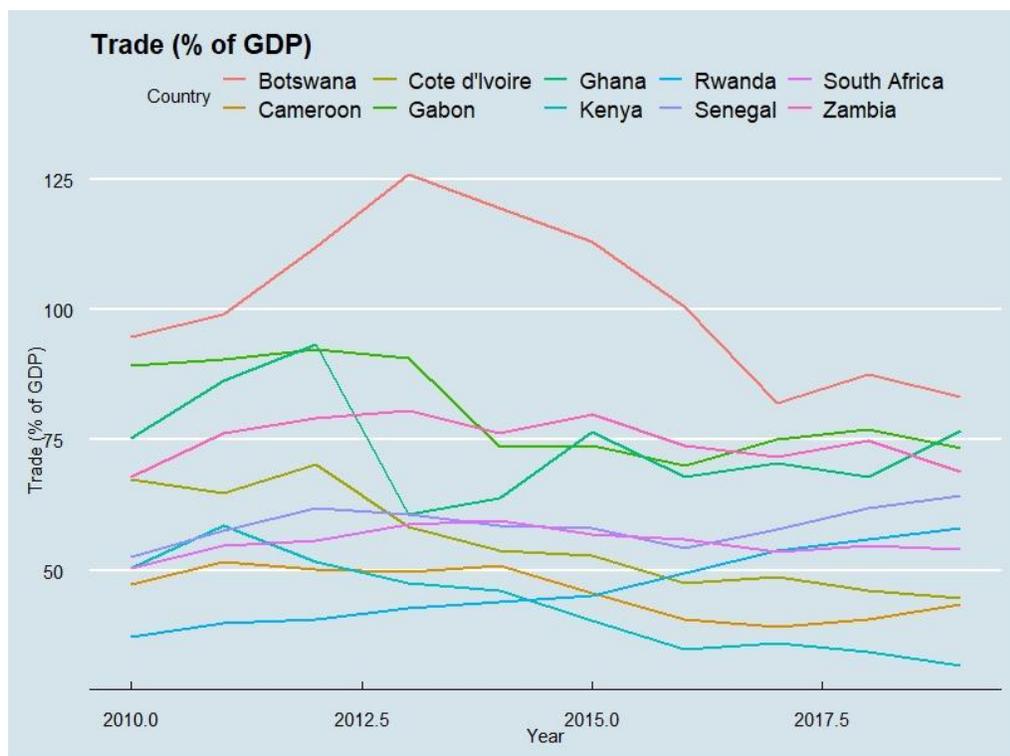
The last variable plotted in this research is represented in Figure 7 below, showcasing the openness of each country to engage in international trade. The percentage on the y-axis, indicates the contribution of trade to the GDP of the respective countries within the sample group. From the initial impression, a downward trend is observed in the contribution of trade to the GDP of those countries in the sample group.

Further delving into the data shows that all countries, except Cameroon, Kenya, and Rwanda, have trade contributing at least 50%, to their respective GDPs year-on-year.

Botswana is highlighted as having the highest trade (% of GDP) among the spread of countries in the sample group, with an average trade contribution of 101% to GDP over the 10-year time period. Trade contribution to GDP in Botswana peaked in 2013, at 125%, before going into a decline for the next four years.

The plot on the data also shows Rwanda and Senegal having experienced the largest growth in trade contribution to GDP over the timeframe under review, where Rwanda saw an increase from 37% in 2010 to 58% in 2019. Senegal also saw an increase from 52% in 2010, to 64% in 2019.

Figure 7 – Trade (% of GDP) – Trade Openness



5.3 Data Analysis

In conducting the required data analysis, an initial step was to conduct a multicollinearity test, which is used to assess the degree of correlation between the selected variables, including the dependent variable and the independent variables, prior to conducting a regression analysis (Daoud, 2017). The results are presented in Tables 2 – 4.

It is expected for there to be a correlation between independent variables (predictor) and dependent variable (response), as the predictor would influence the response in some manner. The test for multicollinearity, is aimed at identifying two or more predictors that have a high correlation with each other. Where this is present, it may deem the model applied for the research unreliable.

The findings from the tables below shows the existence of a strong negative correlation between the predictive variables of Index of Trade Freedom (TradeIndex) and Cost to Trade (CosttoTrade), with a value of -0.7. The same is observed when the logs of these variables are factored into the multicollinearity test. The results thus showed no concerns on multicollinearity.

Table 2 – Multicollinearity Assessment A

Description	TradeIndex	TradeOpenness	CosttoTrade	GDPCapita
TradeIndex	1.00	0.29	-0.74	0.04
TradeOpenness	0.29	1.00	-0.17	0.51
CosttoTrade	-0.74	-0.17	1.00	0.25
GDPCapita	0.04	0.51	0.25	1.00
LogisticsIndex	0.34	-0.18	-0.19	0.27
GrossMerch	0.35	-0.02	-0.01	0.45
GrossMerchlog	0.51	0.10	-0.31	0.15
TradeIndexlog	1.00	0.27	-0.75	0.02
TradeOpennesslog	0.28	0.98	-0.13	0.50
CosttoTradelog	-0.71	-0.22	0.97	0.20
GDPCapitalog	0.04	0.54	0.26	0.97
LogisticsIndexlog	0.34	-0.17	-0.22	0.24

Table 3 – Multicollinearity Assessment B

Description	TradeOpennesslog	CosttoTradelog	GDPCapitalog	LogisticsIndexlog
TradeIndex	0.28	-0.71	0.04	0.34
TradeOpenness	0.98	-0.22	0.54	-0.17
CosttoTrade	-0.13	0.97	0.26	-0.22

GDPCapita	0.50	0.20	0.97	0.24
LogisticsIndex	-0.18	-0.12	0.30	1.00
GrossMerch	0.00	0.08	0.48	0.70
GrossMerchlog	0.11	-0.19	0.27	0.66
TradeIndexlog	0.26	-0.71	0.03	0.35
TradeOpennesslog	1.00	-0.17	0.53	-0.17
CosttoTradelog	-0.17	1.00	0.23	-0.14
GDPCapitalog	0.53	0.23	1.00	0.27
LogisticsIndexlog	-0.17	-0.14	0.27	1.00

Table 4 – Multicollinearity Assessment C

Description	LogisticsIndex	GrossMerch	GrossMerchlog	TradeIndexlog
TradeIndex	0.34	0.35	0.51	1.00
TradeOpenness	-0.18	-0.02	0.10	0.27
CosttoTrade	-0.19	-0.01	-0.31	-0.75
GDPCapita	0.27	0.45	0.15	0.02
LogisticsIndex	1.00	0.74	0.66	0.34
GrossMerch	0.74	1.00	0.81	0.35
GrossMerchlog	0.66	0.81	1.00	0.51
TradeIndexlog	0.34	0.35	0.51	1.00
TradeOpennesslog	-0.18	0.00	0.11	0.26
CosttoTradelog	-0.12	0.08	-0.19	-0.71
GDPCapitalog	0.30	0.48	0.27	0.03
LogisticsIndexlog	1.00	0.70	0.66	0.35

In further analysing the data and scrutinising the relationship that trade liberalisation has with increasing intra-African trade volume, the next statistical approach considered was the pooled ordinary least square (OLS). The use of the pooled OLS is a common and simple means of estimating panel data, and the results are shown in Table 5 below.

Table 5 – Pooled Ordinary Least Square

Coefficients	Estimate	Std. Error	z-value	p-value
TradeIndex	549,030,000.00	121,510,000.00	4.52	0.00 ***
TradeOpenness	- 66,224,000.00	45,274,000.00	- 1.46	0.15
CosttoTrade	3,670,100.00	1,073,200.00	3.42	0.00 ***
GDPCapita	976,100.00	327,600.00	2.98	0.00 **
LogisticsIndex	13,990,000,000.00	1,937,400,000.00	7.22	0.00 ***

Significance codes: ' *** ' 0.001, ' ** ' 0.01, ' * ' 0.05

Total Sum of Squares: 1.0126e+22

Residual Sum of Squares: 3.1998e+21

R-Squared: 0.684

Adj. R-Squared: 0.66719

F-statistic: 40.693 on 5 and 94 DF, p-value: < 2.22e-16

The Pooled OLS showed a r-squared statistic of 68%, indicating that the pooled independent variables accounted for 68% of the outcome of the dependent variable, gross merchandise trade. However, the research also notes the limitations of the pooled OLS on panel data, as highlighted in the seminal work of Bass and Wittink (1975).

The pooled OLS model is noted for its faults in neglecting individual, unobserved heterogeneity effects that may be present within the panel data. Taking into consideration that the research data is also cross-sectional in nature, it is imperative to take into account the individual, unobserved effects of the respective countries within the selected sample, in order to avoid the bias of omitted variables.

Bass and Wittink also noted the limitations of the pooled OLS in time invariance, which assumes the relationships between the various variables do not change over time, whereas, in reality, such relationships do change over time. This is specifically observed in the fluctuations in the independent variables over the 10-year time series.

Finally, concerns on data endogeneity are raised, especially as the pooled OLS would largely fail to test for correlations between dependent and independent variables. These raise a number of concerns, with sufficient reasons, for the research to apply more effective panel regression analysis models that are better suited for the data collected, ensuring robustness and validity of the findings.

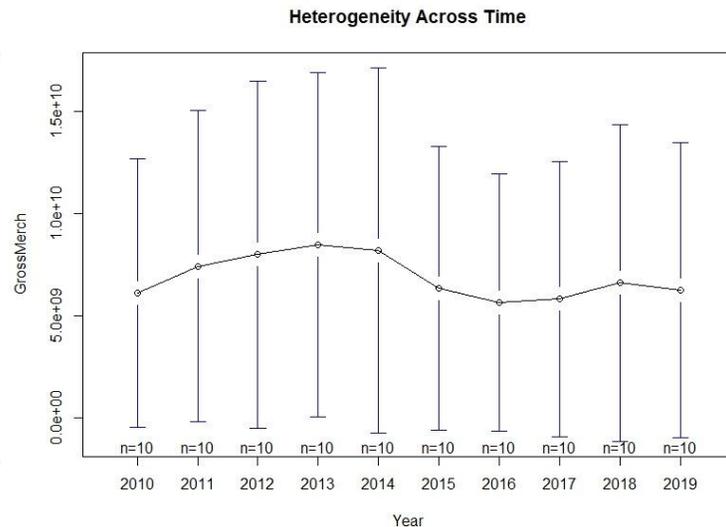
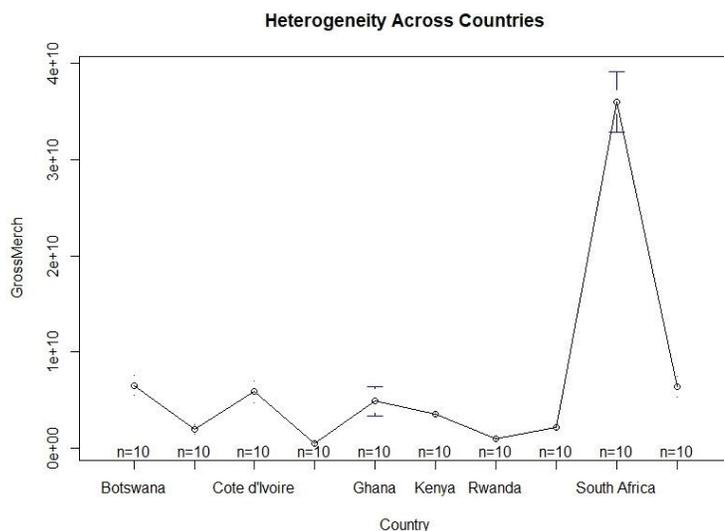
As this research sought to delve deeper into the data, ensuring the robustness of the research, a combination of dynamic panel data regressions was applied. As such, the lag of the dependent variable is introduced in the analysis, and considered to be an explanatory variable. In ensuring robustness in the selection of the right dynamic panel analysis to use, the data was tested for heterogeneity across countries within the sample, as well as across time.

The below showcases the transformation of the variables into lag;

```
pooling = plm(diff(GrossMerchlog) ~ lag(diff(GrossMerchlog))
+ lag(diff(TradeIndexlog))
+ lag(diff(TradeOpennesslog))
+lag(diff(Costlog))
+lag(diff(GDPCapitalog))
+ lag(diff(LogisticsIndexlog))
+Year-1|lag(GrossMerchlog, 2)
+ lag(TradeIndexlog, 2)
+ lag(Tradelog,2)
+ lag(CosttoTradelog, 2)
+ lag(GDPCapitalog, 2)
+ lag(LogisticsIndexlog, 2)
+ Year-1, data = pdata, model = "pooling")
```

Figure 8 below, highlights the findings of the tests of heterogeneity across the countries of the research sample, and the time dimension of 2010-2019. The output of the test shows that, the means of the dependent variable, Gross Merchandise Trade (GrossMerch), is different across the respective countries, as well as across the time dimension. This finding justified why the basic multiple regression would not be a sufficiently robust model for this research.

Figure 8 – Heterogeneity across countries and time



Taking the above findings into account, the use of the dynamic panel data regression is proven to be adequate. The dynamic panel data regression also deals with endogeneity as expressed in Nickell's bias, where the lagged dependent variable could possibly share a correlation with an unobserved individual-specific effect (Nickell, 1981). The dynamic panel data regression also introduces the use of instruments that deal with inconsistent estimators within the data.

The work of Anderson and Hsiao (1982) recommended the use of an instrumental variable with the lag period, whilst using the first difference and/or second difference of the dependent variable. Anderson and Hsiao's approach, whilst consistent, has been critiqued by Arellano and Bond (1991) for not being sufficiently efficient, as available instruments did not exploit moment conditions. Their proposed recommendation was to follow the system generalised method of moments (GMM) estimator.

In keeping to the robustness checks, the research proceeded with the relevant tests of a dynamic panel data regression, whilst including tests from the system GMM.

5.3.1 Generalised Method of Moments (GMM)

The next step in data analysis was the pooling statistical model being applied. This step examined the gross merchandise trade, analysing it in a function that took into account other independent macro-economic variables, namely: index of trade freedom, cost to

trade, trade openness, GDP per capita, and the Logistics Performance Index, as the independent variables. The Pooling Model is expressed as below.

Pooling Model: $Y_{it} = \alpha + \beta Y_{it-1} + \delta X_{it} + \mu_i + \varepsilon_{it}$

where:

Y_{it} = the dependent variable gross merchandise trade measured for country *vis-à-vis* at time t ,

α = the intercept constant of the regression line,

β = the slope coefficient (short run effect) of Y_{it-1} ,

δ = the slope coefficient of X_{it} (the independent variables measured for country *vis-à-vis* at time t),

μ_i = Individual-specific effects, and

ε_{it} = error term for country *vis-à-vis* at time t .

Building upon the recommendation of Anderson and Hsiao regarding the earlier lag period of the model as an instrumental variable (IV), with first difference and/or second difference of the dependent variable being considered as an instrumental variable, their model recommendation is expressed below.

Instrument Variable: $\Delta y_{it} = \beta \Delta(y_{it-1}) + \delta(\Delta x_{it}) + (\Delta \varepsilon_{it})$

where:

Δ = the difference or change,

Y_{it} = the dependent variable gross merchandise trade measured for country *vis-à-vis* at time t ,

β = the slope coefficient (short run effect) of Y_{it-1} ,

δ = the slope coefficient of X_{it} (the independent variables measured for country *vis-à-vis* at time t), and

ε_{it} = error term for country *vis-à-vis* at time t .

In applying the lagged pooling model, as shown in **Table 6** below, the results show a positive relationship between the dependent variable (Gross Merchandise Trade) and the independent variables. It was also noted that the R-Squared of 0.034 based on this model was obtained, indicating only 3% of the dependent variable was explained by the independent variable. It is also observed that, even as the coefficients in the pooling model show a positive relationship between the dependent and the independent variables, they are not statistically significant.

Table 6 – Anderson and Hsiao (1982) method

Coefficients	Estimate	Std. Error	z-value	p-value
lag(diff(GrossMerchlog))	1.326123	2.891701	0.4586	0.6465
lag(diff(TradeIndexlog))	1.246239	3.472953	0.3588	0.7197
lag(diff(TradeOpennesslog))	0.439307	4.9501	0.0887	0.9293
lag(diff(Costlog))	-4.605568	19.02769	-0.242	0.8087
lag(diff(GDPCapitalog))	-0.677942	3.411192	-0.1987	0.8425
lag(diff(LogisticsIndexlog))	0.072185	1.38684	0.0521	0.9585
Year 2012	-0.254619	0.385009	-0.6613	0.5084
Year 2013	0.023628	0.184302	0.1282	0.898
Year 2014	-0.177696	0.447485	-0.3971	0.6913
Year 2015	-0.140057	0.229706	-0.6097	0.542
Year 2016	0.258515	0.790506	0.327	0.7436
Year 2017	0.143346	0.324785	0.4414	0.659
Year 2018	0.150408	0.272569	0.5518	0.5811
Year 2019	-0.149678	0.22972	-0.6516	0.5147

R-Squared: 0.034512, Adj. R-Squared: -0.15566

Chisq: 8.54933 on 14 DF, p-value: 0.85879

5.3.2 Difference Generalised Method of Moments (GMM)

The next data analyses test conducted was the initial and transformed difference GMM model, which tested the response of gross merchandise trade to the effects from independent variables of index of trade freedom, cost to trade, trade openness, GDP per capita and the logistics performance index. The initial model and the transformed model, follow the recommended approach of Arellano and Bond's 1991 work.

Initial model: $\ln Y_{it} = \Phi \ln Y_{it-1} + \beta X'_{it} + (\eta_i + \varepsilon_{it})$

Transformed model: $\Delta \ln Y_{it} = \Phi \Delta \ln Y_{it-1} + \beta \Delta X'_{it} + \Delta \varepsilon_{it}$

where:

Δ = the difference or change,

Y_{it} = the dependent variable, gross merchandise trade, measured for country *vis-à-vis* at time t ,

Φ = the slope coefficient (short run effect) of Y_{it-1} ,

β = the slope coefficient of X'_{it} (the independent variables measured for country *vis-à-vis* at time t), and

ε_{it} = error term for country *vis-à-vis* at time t .

The completion of the regressors from the initial model to the transformed model through first differencing, ejects the fixed effect, and as such, effects does not change over time. It however does not resolve the problem of endogeneity. Accordingly, the transformed model applied took the function of $\Delta \mu_{it} = \Delta \eta_i + \Delta \varepsilon_{it}$, as the unobserved fixed effects are taken out of the equation.

The transformed model, through the first differenced lagged dependent variable, was implemented using the past levels of the dependent variable, based on the assumption of any changes of the dependent variable being captured within the transformed model, in alignment with Arellano and Bond.

Table 7 below showcases the difference GMM coefficients upon completion of the analysis as described above. The analysis show three statistically significant coefficient's lag difference, being GrossMerchlog, TradeIndexlog, and TradeOpennesslog at 0.00 and 0.01 respectively. The result of the analysis also shows the p-value of the Sargan test to be 0.99999. This causes the research to fail to reject the null hypothesis that the instrument variable is valid.

Table 7 – Difference Generalised Method of Moments

COEFFICIENTS	ESTIMATE	STD. ERROR	Z-VALUE	P-VALUE
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LAG(GROSSMERCHLOG)	0.395701	0.10182	3.8863	0.0001018 ***
LAG(TRADEINDEXLOG)	-0.726355	0.18445	-3.938	8.218e-05 ***
LAG(TRADEOPENNESSLOG)	0.693455	0.323235	2.1454	0.0319243 *
LAG(COSTLOG)	-0.427742	0.400876	-1.067	0.2859633
LAG(GDPCAPITALOG)	-0.083369	0.226705	-0.3677	0.7130658
LAG(LOGISTICSINDEXLOG)	-0.246034	0.359144	-0.6851	0.4933079

Significance codes: ' *** ' 0.001, ' * ' 0.05

Sargan Test: chisq(35) = 10 (p-value = 0.99999)

Autocorrelation Test (1): normal = -1.192971 (p-value = 0.23288)

Autocorrelation Test (2): normal = -1.892847 (p-value = 0.058378)

Wald test for coefficients: chisq(6) = 250.023 (p-value = < 2.22e-16)

The analysis also factored in autocorrelation test (1) and autocorrelation test (2), with both tests presenting a p-value greater than 0.05, at a 95% confidence interval. These results indicate that no autocorrelation of error terms existed in orders (1) or (2) of the model. In order to ensure robustness in the Sargan test for instruments and validity, the Difference GMM with Collapse test was also conducted. The results from the Difference GMM with collapse shows a Sargan test p-value of 0.18. The findings are expressed in **Table 8** below:

Table 8 – Difference General Method of Moments with Collapse

COEFFICIENTS	ESTIMATE	STD. ERROR	Z-VALUE	P-VALUE
LAG(GROSSMERCHLOG)	0.48947	0.23526	2.0805	0.037478*
LAG(TRADEINDEXLOG)	-0.87551	0.30383	-2.8816	0.003956**
LAG(TRADEOPENNESSLOG)	0.48716	0.42024	1.1592	0.246356
LAG(COSTLOG)	-0.45604	0.4198	-1.0863	0.277332
LAG(GDPCAPITALOG)	-0.16838	0.32935	-0.5112	0.609181
LAG(LOGISTICSINDEXLOG)	-0.29769	0.30659	-0.971	0.331552

Significance codes: ' ** ' 0.01, ' * ' 0.05

Sargan test: $\text{chisq}(7) = 10$ (p-value = 0.18857)
 Autocorrelation test (1): normal = -1.076676 (p-value = 0.28163)
 Autocorrelation test (2): normal = -1.772101 (p-value = 0.076378)
 Wald test for coefficients: $\text{chisq}(6) = 90.56965$ (p-value = < 2.22e-16)

5.3.3 Fixed Effect Model

The following fixed effect model was also introduced into the research, with the sole aim of comparing the selecting between the Difference GMM and System GMM models. Table 9 below shows the response of Gross Merchandise Trade to the indicated independent variables. The findings show that the coefficients of the lag gross merchandise trade log, and the lag of trade openness log are statistically significant at the 95% confidence level.

There is also a noted R-squared statistic of 50% and adjusted R-squared statistic of 39.9% of the independent variables effect on the dependent variable of Gross Merchandise trade. This r-statistic results highlights the limited effect of the independent variables on the dependent variable.

Table 9 – Fixed Effect

COEFFICIENTS	ESTIMATE	STD. ERROR	Z-VALUE	P-VALUE
LAG(GROSSMERCHLOG)	0.494706	0.109571	4.5149	2.35E-05***
LAG(TRADEINDEXLOG)	-0.581116	0.489235	-1.1878	0.23871
LAG(TRADEOPENNESSLOG)	0.637719	0.251431	2.5364	0.01331*
LAG(COSTLOG)	-0.451097	0.657892	-0.6857	0.49506
LAG(GDPCAPITALOG)	0.071578	0.213014	0.336	0.7378
LAG(LOGISTICSINDEXLOG)	0.087234	0.272889	0.3197	0.75012

Significance codes: '***' 0.01, '*' 0.05

Total Sum of Squares: 6.0512

Residual Sum of Squares: 3.0224

R-Squared: 0.50053

Adj. R-Squared: 0.39929

F-statistic: 12.3595 on 6 and 74 DF, p-value: 1.3687e-09

A further assessment of system Generalised Method of Moments on the data was conducted, to compare with the earlier Fixed Effect Model, and identify the most appropriate model for the analysis.

5.3.4 System Generalised Method of Moments (GMM)

The final statistical test conducted, assessing the volume of gross merchandise trade and the respective independent variables of; index of trade freedom, cost to trade, GDP per capita, trade openness and the LPI, is the System GMM model. The model builds on the two equations of the GMM, the first being the Initial Model; $\ln Y_{it} = \Phi \ln Y_{it-1} + \beta X'_{it} + (\eta_i + \varepsilon_{it})$, and the Transformed model; $\Delta \ln Y_{it} = \Phi \Delta \ln Y_{it-1} + \beta \Delta X'_{it} + \Delta \varepsilon_{it}$, both of which were earlier described above.

The difference with the system GMM is its ability to correct endogeneity by the introduction of additional instruments that present the capability to elevate the efficacy of the GMM. This is done through the transformation of the variables to become uncorrelated with the identified fixed effects within the model. Table 10 below highlights the findings in application of the system GMM.

Table 10 – System General Method of Moments

COEFFICIENTS	ESTIMATE	STD. ERROR	Z-VALUE	P-VALUE
LAG(GROSSMERCHLOG)	0.796444	0.301315	2.6432	0.008212**
LAG(TRADEINDEXLOG, 1:1)	-1.270603	1.72162	-0.738	0.460498
LAG(TRADEOPENNESSLOG, 1:1)	0.729962	1.863015	0.3918	0.695193
LAG(COSTLOG, 1:1)	0.765742	0.74238	1.0315	0.302321
LAG(GDPCAPITALOG, 1:1)	0.039421	0.399078	0.0988	0.921313
LAG(LOGISTICSINDEXLOG, 1:1)	0.967464	2.516022	0.3845	0.700592

Significance codes: ' ** ' 0.01

Sargan test: $\text{chisq}(48) = 7.65324$ (p-value = 1)

Autocorrelation test (1): normal = -1.538567 (p-value = 0.12391)

Autocorrelation test (2): normal = -1.48507 (p-value = 0.13753)

Wald test for coefficients: $\text{chisq}(6) = 1356049$ (p-value = $< 2.22\text{e-}16$)

The summary of findings from the system GMM, as shown above, highlights the statistically significant coefficient of the lagged gross merchandise trade value, at the

95% confidence level. All other lagged values tested under the system GMM, generated coefficients that were not statistically significant.

Furthermore, the p-value of the Sargan test conducted presented a value of 1, which is >0.05 . Similar to the findings in the differenced GMM, the system GMM result also leads the research to fail to reject the null hypothesis of the instrument variable as valid. The p-values of the autocorrelation tests (1) and (2), are both >0.05 , indicating no autocorrelation between the error terms of order 1 and order 2 of the system GMM model.

5.4 Summary of Findings

The findings of the research, which sought to unravel the relationship between trade liberalisation and increased intra-African trade volume for 10 Sub-Saharan African countries, obtained some key insights after taking into account various statistical tests and models. The different statistical tests and models used to analyse the data, included lagged pooling, difference GMM, and difference GMM with collapse, a fixed effect model, and a system GMM model.

The key findings from the data analysis are as follows:

The lagged pooling model showcased a positive relationship between the dependent variable (Gross merchandise trade) and independent variables (index of trade freedom, cost to trade, GDP per capita, trade openness and the LPI). However, the coefficients were not statistically significant. The R-squared was low at 3%, indicating a limited explanatory power of the independent variables above listed. In considering this outcome, the result highlighted how the pooling model, albeit lagged, is not an appropriate model for obtaining insights into the research.

The difference GMM model output was observed to be a better statistical method for the research than the pooled OLS approach. This model highlighted some statistically significant variables, namely the lagged coefficients of the gross merchandise trade, index of trade freedom, and trade openness variables. As the nature of the difference GMM model also tests the validity of the instrumental variables (IV) of regression models, the Sargan test results were also analysed. The Sargan test accounted for endogeneity and omitted variable bias, with its results leading the research to fail to

reject the null hypotheses. The null hypothesis of the Sargan tests implies that the research failed to reject the null hypothesis that the IV is valid. It also showed that the autocorrelations are uncorrelated with the error term.

The result from the fixed effect model demonstrated that the lagged gross merchandise trade and lagged trade openness variables had statistically significant coefficients. With an R-square of 50%, the model suggested that fifty percent of the dependent variable was determined by the lagged independent variable. It is worth noting that the lagged gross merchandise trade variable was also shown to have a statistically significant effect in the analysis.

Finally, the system GMM model was capable of observing the statistically significant coefficient for the lagged Gross Merchandise Trade, with other lagged values not being statistically significant. The Sargan test and autocorrelation tests, similar to the difference GMM model, caused the research to fail to reject the null hypothesis of the Sargan test.

The observed implications of these findings from the research, suggest that trade liberalisation may have a positive impact on increased intra-African trade volume, but is not statistically significant. The extent of this impact is shown to vary, depending on the statistical model used. The results are discussed further in the chapter below.

Chapter 6 – Discussion of Results

The findings of the research implicitly expressed the complexity in identifying the relationship between trade liberalisation and increased intra-African trade volume. The overall purpose of the research sought to determine whether increased trade liberalisation would have a positive relationship with intra-African trade volume, or whether a negative relationship existed. This finding is significant to both government policy makers and private sector businesses, especially with the increased focus on the AfCFTA's implementation.

The results of this research as presented in the previous chapter revealed some interesting insights into the research question. In further scrutinising these findings, this chapter follows a structured approach in linking the research purpose to the observed complexities faced within this topic, the theoretical observations within the findings, and the considerations of the chosen methodological choices. Most importantly, this chapter discusses the answer to the research question, as well as the limitations of the answer in itself.

The research took into account key considerations of economic theory, with frameworks of comparative advantage, and the H-O theory, imperfect competition, MNC theory and the system GMM model.

6.1 Observed Complexities in Trade Liberalisation

The conduction of this research was largely guided by the availability of data for the countries within the sample. However, the research did not take into account the variability of economic policies signed and/or ratified in the various countries within the sample. Trade liberalisation, as described by Ali, Kiani and Hafeez (2018), hinges on an economy that deliberately reduces the barriers to trade goods and services with other economies. This requires the economy to reduce tariffs and other costs to trade for both inbound and outbound trade lanes.

In the conduction of the research data analysis, the degree to liberalisation initiatives applied by each country within the sample was not taken into account. The measure of trade openness, as a gauge for the level of trade liberalisation within a respective

country (Wang, Wang, & Li, 2023), is observed to not be wholly complete assessment of liberalisation on its own, especially under a pooled OLS approach.

What becomes ever more observable is the integrated nature of trade liberalisation across various development segments, including infrastructure development, industrial development, innovation, economic development, and favourable policies that support the reductions in cost to trade. The relatively stagnant growth of these elements, across the independent variables, over the 10-year time series, shows a reflection of the position taken up by Yameogo and Omojolaibi (2021), namely that African nations do not take full advantage of their liberalisation initiatives.

6.1.1 Integrated Nature of Liberalisation

Gross Merchandise Trade in SSA

The research adopted the Gross Merchandise Trade in SSA, as the dependent variable within this research. One of the initial observations in the data, was the degree to which the contribution of merchandise trade to, and from, SSA countries was limited, relative to the merchandise trade as a percentage of GDP of the respective country within the sample set.

This is expressed within **Table 11**, where the average values for each country within the sample group is presented. The averages over the 10-year time series are used to allow a simpler representation of the table within the research report.

Table 11 – Merchandise Trade Breakdown in SSA (2010 – 2019)

Country	Average Merchandise exports to SSA (% of total merchandise exports) – 2010 – 2019	Average Merchandise imports SSA (% of total merchandise imports) – 2010 – 2019	Average Merchandise trade (% of GDP) – 2010 – 2019
Botswana	21	75	90
Cameroon	13	23	30
Cote d'Ivoire	29	25	48
Gabon	3	9	66
Ghana	29	9	53
Kenya	37	9	33
Rwanda	41	29	36
Senegal	44	15	48
South Africa	26	11	52
Zambia	23	55	68

The research focused on changes in merchandise trade volume when trade liberalisation is vectored into economies. Part of the criteria in the selection of the sample countries included their trade as a percentage of GDP. The countries in the final sample all had trade as a percentage of GDP exceeding 50% at least two times over the period under review.

Table 11 above shows the significant variances between the sample countries in terms of their average volume of merchandise trade with other SSA countries, as a percentage of total merchandise trade as a percentage of GDP. Gabon, Zambia, and Botswana are those nations that are noted to have the highest average merchandise trade as a percentage of GDP.

Gabon, which had an average merchandise trade as a percentage of GDP of 66% over the 10-year time series, conducted very little merchandise trade with other countries in SSA. The nation showed an average merchandise export trade to SSA countries of 3%, and imports of 9% between 2010-2019. This indicates that a large volume of the country's overall trade in merchandise is conducted with other countries outside SSA.

Zambia also showed an average merchandise trade as a percentage of GDP of 68%, with 23% of merchandise export trade volume going to SSA countries, and an increased 55% of merchandise imports coming from SSA countries. Zambia is shown to be among the highest merchandise import countries in the research sample, with existing membership and strong trade ties with the Southern Africa Development Community (SADC) and the Common Market for East and Southern African States (COMESA) (Mapuva & Muyengwa-Mapuva, 2014).

Finally, Botswana, which, at 90%, has the highest average merchandise trade as a percentage of GDP, is also observed to have an average merchandise export of 21% to SSA countries, whilst having an average of 75% of all its merchandise imports coming from SSA countries. Similar to Zambia, Botswana is also a member of the SADC, as well as the Southern African Customs Union (SACU).

In analysing the trends of the countries with higher intra-African trade volumes, namely Zambia and Botswana, both countries are shown to be part of those RTAs that have been noted as some of the best performing across the African continent. This is a position that is further reiterated by the work of Carrere (2004), where she argues that economies within the SADC block traded three times more among themselves, than was estimated in gravity model results prior to her study. This finding reinforces the argument of Rauch (1999) that increased volume of trade between countries is influenced by shared linguistic and/or other historic ties.

Carrere's research also highlights the observed significant increase in intra-regional trade in Africa, post the implementation and ratification of RTAs. Carrere's position is contested by Afesorgbor (2019), who argued that the underwhelmed bilateral trade between countries in SSA was not statistically significant, although they did present a positive influence.

Intra-regional trade in some of the RECs was largely driven through trade diversion during the first years of the RTA implementation, while other RECs saw growth based on other factors including the evolution of a currency union that was relatively stable over the years (Carrere, 2004).

During the data analysis, the lag of all variables were introduced, in line with the recommendation of Anderson and Hsiao (1982). The lagged gross merchandise value, which had also been introduced as another independent variable in the model, showed a strong positive effect, that was statistically significant, on increasing intra-African trade volume. This was consistent in the difference GMM, Fixed Effect Model, and the system GMM models.

Index of Trade Freedom

The first independent variable within the research report was the index of trade freedom, a sub-index of the economic freedom index created by the Heritage Foundation (The Heritage Foundation, 2023). The higher a country scores on the index of trade freedom, on a scale ranging from 0 – 100, the better the freedom of trade within the country, according to the foundation. The index is updated annually and has been compiled using datasets from the Heritage Foundation and the Wall Street Journal since 1995.

As the dependent variable showcases the composition and flows of intra-African trade within SSA, the Index of Trade Freedom provides additional insights as to the effect of tariffs and non-tariff measures on the volume of trade engaged in by a country. The Index itself has also been shown to have a strong positive impact on the economic growth of countries (Hussain & Haque, 2016)

Table 12 below shows the average ranking for the ten countries within the sample group of this research. There are key highlights in Table 12, which brings to the fore certain effects the index has on the gross merchandise trade with SSA. Notably, Botswana and Zambia show the highest average index of trade freedom, with average index ratings of 80 each. This indicates that the country's trade freedom had been mostly free over the 10-year time period. Cameroon and Gabon, are both countries considered mostly unfree, with index scores of 57 and 60, respectively (The Heritage Foundation, 2023).

The trade freedom index in Botswana, has seen some significant growth over the years, as the index has improved over the time period under review. This has also translated into the increased trade engaged with other SSA countries, especially when taking advantage of deliberate trade policy initiatives such as the Botswana National Trade Policy Network (NTP) (UNCTAD, 2016). Under this NTP policy framework, the country was able to translate its strategy into action.

Zambia also has a trade policy framework that has guided the trade policy approach of the country. Unlike Botswana though, the nation has struggled to evolve from its reliance on copper exports and engage in value addition and high value industries. As the nation struggles to diversify its manufacturing base, it is observed to have been incapable of translating its capabilities, observed in its high index score, into economic growth (UNCTAD, 2016).

In the case of Gabon, which has the second lowest index rating, inefficient and highly bureaucratic measures contribute to the low ranking on the index. A high incidence of discretionary fees and multiple stops and inspections of goods being transported makes it difficult for traders to remain competitive (World Bank, 2022). This demonstrates the challenges traders face in cross-border trade within SSA, reiterating the low export and import trade with SSA.

Finally, Cameroon, which holds the lowest index ranking among the sample set for the time period average, with the Central African nation averaging an index of 57. The nation has a 15% average tariff, and is plagued with multiple elements of red-tape and other non-tariff measures that hinder the free flow of trade by the country to the rest of SSA, as well as globally.

The rest of the countries within the sample fall within the category of moderately free trading. Table 12 below shows more information on the 10-year series of the index.

Table 12 – Average Index of Trade Freedom (2010 – 2019)

Row Labels	Average of Index of Trade Freedom
Botswana	80
Cameroon	57
Cote d'Ivoire	71
Gabon	60
Ghana	66
Kenya	67
Rwanda	74
Senegal	72
South Africa	76
Zambia	80

The assessment of the index of trade freedom, also highlighted the challenges and limitation that any independent variable has on its own (Ulaşan, 2015). Zambia, which has been ranked higher on the index, with a rating of 80, still struggled to increase economic growth; and by extension, to increase intra-Africa trade volume.

Within the data analysis, the index of trade freedom is not statistically significant across the various statistical tests conducted, highlighting that this variable on its own could not be proven to increase intra-African trade volume. This finding is in line with the Ulaşan's 2015 findings, where his report argued that simply reducing tariff barriers to trade on its own will not lead to increased economic growth and intra-African trade volume.

The statistical findings in this research stand in contrast with the arguments of Dai, Yotov and Zylkin (2013), who argued that trading volume between members of an RTA saw an increase with reduced tariffs. This was conditional on key elements of infrastructure development, economic policies, and political stability within the member countries. The findings from this research support the argument of Rodriguez and Rodrik (2000), where

their findings highlighted the weak evidence lower tariff barriers to trade had, in increasing trade volume.

Cost to Trade

The independent variable of cost to trade is the one variable that caused the dataset to be unbalanced. The data collected for the time-series was obtained from the World Bank's Database, which only began the consolidation of the costs to trade in 2014, hence data for the years of 2010-2013 were unattainable (World Bank, 2023). Furthermore, the cost structure, in raw data form, constituted four main variables, namely:

- cost to export, documentary requirement;
- cost to export, border requirements;
- cost to import, documentary requirement; and
- cost to import, border requirement.

The combined values of these costs were considered for the data analysis, as the significance of trade costs is pertinent in shaping the SSA trade and production environment (OECD & WTO, 2015). The substantial influence on industrial production and specialisation is largely dependent on favourable costs that allows the region to be competitive, and for countries within SSA to increase intra-African trade, as highlighted in the work of Deardorff (1982).

There are some concerns raised however, as the cost to trade over the 10-year time series, seemingly did not change that significantly for the sample countries. Whilst the research data collected was secondary in nature, the reported values are broadly expected to have fluctuated more, year-on-year.

Within the data analysis and across the multiple models tested, the cost to trade was not statistically significant in increasing trade volume with SSA countries. The index however did show a negative effect on the dependent variable within the fixed effect model, indicating that reduced costs to trade would have an incremental or opposite effect on intra-African trade volume. This finding was observed across all the accepted models tested, including the GMM, system GMM, and fixed effects model, the cost to trade was not statistically significant in increasing gross intra-African trade volume.

The results did align with the findings put forward by Portugal-Perez and Wilson, (2009), within which the authors posited that, reduced trade costs would encourage African SMEs to engage in intra-African trade. Whilst the findings of this research shows the inverse association of increased trade cost to increasing intra-African trade volume, the findings note that costs to trade is not statistically significant.

Trade Openness

The contribution of trade, imports and exports, as a percentage to the GDP of the economies within the sample group is also considered as trade openness. The analysis of the data highlighted that, most of the economies had an average of 63% of trade contributing to their national GDP. Whilst this indicates that the economies within the sample understand the contribution trade openness brings to economic development (Edo, 2023), it remains noted that volume of trade with other SSA countries remains low (UNCTAD, 2019).

Over the 10-year time series, Botswana is once again seen to have trade as a percentage of GDP, the highest across the sample group. There is an average percentage of 102%, and the economy observing peaks in 2012, 2013 and 2014 where trade as a percentage of GDP were 112%, 126% and 113%, respectively. Such high trade as a percentage to GDP indicates Botswana's international trade (exports and imports), is a larger contributor to the nations economic growth than the nations domestic economy.

The openness of trade by Botswana, in tandem with the nations implementation of liberalisation policies invites FDI, and contributes to its higher trade volume with other SSA countries, increasing both competition and specialisation. This is observed in Botswana's high dependence on its mining sector, with a specialisation in diamonds (UNCTAD, 2016; Jiao, Shen, & Liu, 2022).

Cameroon and Rwanda both show among the lowest openness to trade, albeit over the time series, that Rwanda's trade openness has seen continuous growth from 37% in 2010, to 58% in 2019. The increase in trade openness for Rwanda has supported the economic growth of the nation, including a slight increase in the GDP per capita of its

citizens. Rwanda also saw year-on-year increases in intra-African trade volume, as their trade openness increased.

Cameroon, on the other hand, with an average trade openness of 46% over a 10-year time period, presented the lowest value of openness vis-à-vis the other countries in the sample group. Over the time-period under study, the trade contribution to the GDP of Cameroon fluctuated several times, moving from 47% in 2010, to 43% in 2019. This is further noted in its low trade volume with other SSA countries.

The findings within the completed analysis of the data, taking all variables into account, demonstrates that trade openness has a positive relationship with increased intra-African trade volume, and is statistically significant within the Fixed Effect Model.

This findings are also in line with the arguments of Alam and Sumon (2020), where their application of a panel cointegration and causality analysis in Asia concluded that trade openness had a positive impact on economic growth. This was through the increased trading volume of the countries within the region, and the bidirectional causality between trade openness and economic growth.

GDP per Capita

The inclusion of GDP per capita into the independent variables, presents a unique measure in identifying the state of innovation and productivity of the country's within the sample group. With domestic resources being allocated towards efficient outputs of production and encouraged innovation through trade liberalisation, economies are estimated to see increased investments across various industries and sectors, based on the competitive advantage of the country (Burange, Ranadive, & Karnik, 2018).

The analysis of GDP per capita for the countries within the sample showed two interesting trends. Firstly the highest average GDP per capita was shown for Gabon, South Africa, and Botswana, respectively in decreasing order. Further analysing the performance of these three economies highlights a bullish trend in GDP per capita, starting from 2011, through to 2015/16.

A downward trend is observed in line with effects from trade openness of these nations, along with their specialisation of productivity based on natural resources. South Africa

and Botswana continue to rely largely on natural resources, and their respective value chains, whilst attempting to diversify manufacturing and production capabilities. This leaves both countries susceptible to volatility within the global commodity markets where most of their natural resources are exported to.

The other seven countries within the sample group, are shown to all have GDP per capita at less than USD2,500. This is representative of the reduced manufacturing value addition conducted within the SSA; from 16.6% in 1990, to 11% in 2018 (Kruse, Mensah, Sen, & de Vries, 2022). This is indicative of the slow shift in the countries' focus away from product diversification in production and increased value addition (as recommended in the work of Lectard and Rougier, 2018).

The analysis of the data also highlighted that, whilst GDP per capita had a positive effect on gross merchandise trade within SSA, its effect was not statistically significant. This is observed in the system GMM model, which when applied, took into account the lag value of the GDP per capita. This finding from this research highlighted that increased GDP per capita would not have any significant effect on increasing intra-African trade in SSA.

Logistics Performance Index (LPI)

The LPI is an index that considers the efficiency and effectiveness of a country's logistics infrastructure, warehousing, customs procedure, and tracking of shipments. For increased intra-African trade among SSA countries, the performance of the country's LPI score determines, to some degree, the ease for traders in that country to engage in trade operations across the region (Rezaei, van Roekel, & Tavasszy, 2018).

The LPI is released bi-annually (every two years), by the World Bank, and is built on the scoring the average of six variables of an economy, using equal weightings, to measure the country's overall position. The six variables that are measured in developing the LPI are the customs efficiency, quality of infrastructure, ease of arranging shipments, quality of logistics services, tracking and tracing of shipments, and timeliness of shipments (Rezaei, van Roekel, & Tavasszy, 2018). The scoring of a country is ranked from 1 to 5, where 1 shows poor LPI performance, and 5 shows exceptional performance.

In analysing the data for the sample countries, averages shown in Table 13 below, South Africa is the only country within the sample set that has an LPI score above 3.0, indicating the superior logistics performance and capabilities of the nation. All the other countries within the sample group, show an LPI score that is less than 3.0, but greater than 1.0 (LPI: < 3 , >1). This initial impression highlights the level and access to local and global value chains across the countries in the sample group, as well as production capabilities, as argued by Baskaran et al. (2011) against the H-O theorem.

A further analysis of the data, showcases that the LPI has a positive relationship with the gross merchandise trade volume with countries in SSA. However, the variable is not statistically significant in the increasing intra-African trade volume. The model applied here was the lagged Fixed Effect Model. This result is in line with the concerns raised by Baskaran et al., who assert that the LPI assumes every country measured to have the same requirements, priorities, and production capabilities.

Table 13 - Average LPI (2010-2019)

Row Labels	Average of Logistics performance index: Overall (1=low to 5=high)
Botswana	2.7
Cameroon	2.4
Cote d'Ivoire	2.7
Gabon	2.3
Ghana	2.6
Kenya	2.8
Rwanda	2.6
Senegal	2.5
South Africa	3.5
Zambia	2.4

6.2 Theoretical Observations in the Results

The results from the data analysis, shows the impact that each of the variables considered within this research has, on increasing trade across SSA. The results has also been compared with prior literature within this field, which reinforced the findings of the works of Ulaşan (2015), Rodriguez and Rodrik (2000), and contradicted parts of the findings of Portugal-Perez and Wilson (2009).

To further unravel the inferences from the results of the research, this sections test the theoretical concepts upon the research findings.

6.2.1 Effect of Comparative Advantage in the Results

The effect of comparative advantage on the findings of this research report is significant. The theory emphasises the need for country's to prioritise investment and production into industries, where they (the country) hold the competitive advantage compared to other trading nations across the world (Dornbusch, Fischer & Samuelson, 1977).

This approach was one that has been adopted by many countries in SSA, leading to the prioritisation in production of raw materials, with low value addition taking place. However, the theory does not account for the intricate factors of production that significantly affect the quality and quantity of products manufactured or produced within countries in SSA (Lectard & Rougier, 2018).

As the availability of finished manufactured products within SSA, and the investments in developing the appropriate value chains, are still in their infancy, SSA continues to rely on imported products from outside the continent (Obeng-Odoom, 2020), which continue to be cheaper and much more easily available. This is partly why the AfCFTA prioritised the sectors of agriculture and agro-processing, automotive, pharmaceuticals, as well as transportation & logistics, as a first step towards building regional capabilities (World Economic Forum, 2023).

The research findings, which include low volume of intra-African trade, also take into account overall lack in substitutes of products that are imported into the SSA region (Ogujiuba, Nwogwugwu, & Dike, 2011). While demand for locally (SSA) produced and/or manufactured products may exist within the region, there remains the constraints of market production complexities based on the manufacturing capabilities of the country and industrial production within the region.

Trade liberalisation initiatives are embedded in full, or in part, of prior trading arrangements within the Regional Economic Communities (RECs) across the sub-region. It is observed that, the translation and implementation of liberalisation policies, by the individual country's within the region, has a significant effect on the success or failure of the liberalisation initiative (Wacziarg & Welch, 2008).

This is directly observed in the findings of the research report when comparing Botswana and Gabon, where Botswana's average gross merchandise trade in SSA, over the 10-year time series is USD 6.5 billion, in comparison to Gabon's USD 525 million. Both countries had a trade openness metric of 102% for Botswana and 81% for Gabon. There is a disproportionate gap of USD 6 billion between both countries merchandise trade value, compared to the 21% gap in their trade openness.

6.2.2 Effect of H-O Theory in the Results

The H-O theory's differentiation from the Ricardian comparative advantage theory is based on the scale of production and manufacturing of a country, noting that country's abundance of resources, capabilities, and other factors of production (Deardorff, 1982). The theory's limitation in assuming each country has identical, and fixed access to fundamental elements of production reveals itself in the results of the initial pooled ordinary least square regression in Table 5.

Further improvements and revisions to the H-O theory, especially with the work of Rauch, (1999) and Baskaran et al. (2011), emphasise the inclusion of trading networks among other perspectives into the theory. Their arguments were centred on the premise of trade volumes tend to increase between countries that share common historical, linguistic and/or cultural ties. As part of the research findings, this is observed particularly in the volume of trade in the countries of Botswana, South Africa, and Zambia, as represented in Table 14.

With South Africa and Botswana both being part of the SADC and SACU, and Zambia being part of SADC, intra-African merchandise trade volume from these countries is noted to be the most significant across the sample group. South Africa, which had Africa's second largest GDP in 2019 at USD 388 billion (Stats SA, 2019), enjoys the highest LPI score across all countries, both within the sample and across SSA as a whole, which contributes the proliferation of trade across the trading RECs it is a part of.

The combination of South Africa's matured manufacturing and production capabilities contributes to its increased merchandise trade with the rest of the sub-region. South Africa's sourcing of merchandise and materials, whether raw or semi-finished, from other

neighbouring countries, Botswana and Zambia, under their respective RTAs, encourages increased intra-African trade. This complements the findings of Baskaran et al. (2011), affirming the distinct increase in trade where a dispersion of production value chains is shared among countries under an RTA.

Table 14 - SADC/SACU Regional Trade Influence

Country	Average Merchandise Trade, SSA in USD (2010 – 2019)	Average of Index of Trade Freedom (2010-2019)	Average Trade (% of GDP) (2010-2019)	Average of Cost of Trade in USD (2010-2019)
Botswana	6,534,899,911.12	80	101.66	660.46
South Africa	35,970,870,675.27	76	55.38	2,055.33
Zambia	6,390,978,009.87	80	74.90	1,125.00

This is also in line with the H-O theory's recommendation to diversify products and manufacturing capabilities of countries (Deardorff, 1982). In effect, encouraging the countries that have the right combination of resources, capabilities, and factors of production, to lead the supply of such products. The theory reinforces the approach of the AfCFTA in prioritising key sectors towards increasing production and manufacturing capabilities, however the theory does not provide sufficient recommendations in managing the consequences of trade-induced winners and losers.

6.2.3 Effect of Imperfect Competition & MNC theory in the Results

The markets structure across all the sample countries within this research largely experience imperfect competition, especially within the priority sectors identified by the AfCFTA, aimed at boosting intra-African trade volumes, and improving productivity across the continent.

In markets such as SSA, where many countries may lack the adequate factors of production, knowledge or skill to scale-up manufacturing and production requirements, there is the requirement for MNCs operating in the markets to increase their own capabilities. The contributions of MNCs to fill the gap is reinforced by Black, Makundi and McLennan (2017), and Bughin et al. (2016).

Whilst the existence of imperfect market conditions would remain over the short to medium term, it becomes relevant for the MNCs and other large organisations that have

dominant market positions to increase and diversify operations across SSA. The contributions of MNCs to the economic development of SSA continues to be significant, and the capabilities of these firms to diversify will contribute towards building local capabilities (Boehm, Dhingra, & Morrow, 2019). The growth and development of such diversified value chains and intra-industry trade, also contributes towards increased intra-African trade volumes.

It becomes imperative for MNCs to diversify their product ranges, and to increase their engagement with local value chains (Ezeoha, et al., 2022). In conjunction with government trade policy, such engagement with LVCs would contribute in increasing the knowledge transfer, skills development and production capabilities of local firms (Sutton & Trefler, 2016), thereby ensuring over the long term, that there would be increased competitiveness and capabilities of local firms engaged across the value chains of the larger MNCs, where the local firms, become more capable to engage in increased intra-African trade.

The results from the research analysis, showed the most statistically significant variable that positively influences increased merchandise trade volume to be the lagged gross merchandise trade log. Effectively, this indicates that the volume of the prior years merchandise trade significantly impacts the performance of subsequent years. This is observed in multiple statistical tests conducted, namely the difference GMM, the difference GMM with Collapse, system GMM, and the Fixed Effect Model.

6.3 Answer to the Research Question

The research sought to relate trade liberalisation and increased intra-African trade growth using a dynamic panel regression. The dependent variable considered within the research was the gross merchandise trade volume among countries in SSA. An initial five independent variables were factored into the models, namely: index of trade freedom, cost to trade, trade openness/trade (% of GDP), GDP per capita and the logistics performance index. Subsequently, a sixth independent variable was included, which was the lagged gross merchandise trade volume.

Across the literature reviewed and the statistical tests conducted, it has been identified that the most statistically significant variable, that affected the dependent variable was

the lagged gross merchandise trade volume. This variable had a positive effect on the dependent variable, and indicated that the prior performance of merchandise trade volume, across previous years, was the element that most affected future increases in intra-African trade.

This finding is in line with the position of Ben-David and Loewy (1998), who posited that, trade liberalisation generates economic growth for countries through increased trade over the long term. In scaling up the volume of intra-African trade, it is imperative for MNCs that hold significant market share to be more involved in domestic LVCs, whilst governments encourage reformations of land rights, labour, and financial access for SMEs across the region (Obeng-Odoom, 2020).

Chapter 7 – Conclusions and Recommendations

This research sought to unravel the effect trade liberalisation has on intra-African trade volume. Specifically, it aimed to assess if trade liberalisation initiatives had an effect on increasing intra-African trade volume. The research was in continuation with prior academic studies within this field, including the work of Ali, Kiani, and Hafeez, (2018) and Yameogo and Omojolaibi, (2021), which both looked at the effect trade liberalisation had on economic growth and poverty. The findings of this report is differentiated by its focus on how trade liberalisation is related in increasing intra-African trade volume.

The topic of increasing intra-African trade was deemed relevant based on two key pillars; the first being the prioritisation of the nations that are signatories to the AfCFTA in increasing their overall volume of trade among each other (AfCFTA, 2023). This was relevant as shown in the context of the UNECA, AUC, AfDB, (2014) report, which emphasised the capabilities of cross-border trade in contributing positively towards the economic development of nations across the world. At the time of this reports release, whilst all African country's are engaged in cross-border trade, only 15% of African trade was conducted within the continent, among peer nations.

The second pillar was the transition by African nations towards improving domestic manufacturing, industrial complexes and value chains (UNCTAD, 2019). This was in line with African nations' attempts to reduce their dependencies on foreign manufacturing and value chains in the wake of improved political stability, economic policies and increased investment in infrastructures that promote trade (Longo & Sekkat, 2004). Historical reliance by African nations on sourcing critical products from outside the continent had been shown to be unsustainable and left African nations sensitive to external market shocks. This was deemed even more important considering the increase in trade protectionism across the world (International Monetary Fund, 2023)

The research topic is relevant as it provides insights into the considerations that could encourage African countries to increase the volume of trade conducted between their respective economies. This is pertinent, especially as the countries of the continent have historically focused on trading raw materials and products, that have little to no value addition included, across large geographies that are imbalanced in the distribution of resource deposits, and industrial and manufacturing hubs.

The introduction of the AfCFTA agreement created a prime environment for African countries to increase their trade volume with each other, especially as research has shown that volume of trade tends to increase between members of a common RTA. (Dai, Yotov, & Zylkin, 2013). The gap that remained, of which this research report answers, is the relationship trade liberalisation has on increasing intra-African trade volume. While there is a significant body of knowledge on how trade liberalisation impacts economic growth, the specific impact it has on increasing intra-regional trade, primarily intra-African trade, is not well-defined. Indeed, there was no clear definition that trade liberalisation would increase export performance among African nations (Gaglio, 2017).

As a fundamental element of the AfCFTA, and other RTA's entered into force on the continent is focused on increasing the volume of trade among African economies (AfCFTA, 2023), increased narratives on the topic had piqued trade liberalisation as a fundamental element in increasing trade volumes.

The concept of trade diversion was also observed as an effect of increased trade liberalisation, as highlighted by He and Dang, (2023), where existing trade relations with economies outside an RTA may be redirected to economies within the membership of the RTA, thereby increasing trade volume. The challenges of trade diversion are however mitigated over time by trade creation, as increased specialisation in manufacturing, production and access to larger regional markets counters the concerns of trade diversion.

Prior research on this topic had equated trade openness to be major indicator of trade liberalisation (Alam & Sumon, 2020). Within this research report, the two concepts are seen as related, but not equal. Trade liberalisation, is considered as the actions taken to reduce the barriers to trade globally, with trade openness representing the extent to which a country is engaged in international trade, based on the contribution of trade to its GDP.

In effect, trade openness is considered as one of variables needed to increase trade liberalisation. The other conditions considered to increase the liberalisation of trade, included the cost to trade, index of trade freedom, GDP per capita and the LPI. The combination of these variables were deemed adequate in summing up the performance

of actions taken by a nation, in improving the conditions for their engagement in international trade, whilst reducing any associated barriers to trade.

Accordingly, this report answers the research question of how trade liberalisation impacts intra-African trade volume. In developing the framework that allowed a detailed analysis of the topic, a methodological approach that combined both descriptive and explanatory strategies was applied. Such a descripto-explanatory approach (Saunders & Lewis, 2018) allowed this report to provide comprehensive insights into the research question, whilst describing key terms and linkages associated with trade liberalisation and increased intra-African trade volume.

The philosophical framework upon which the research was built was one of positivism, which emphasised the evidence from the empirical data to uncover relationships between the various variables considered within the research report (Park, Konge, & Artino, 2020). Albeit the choice of following a positivist philosophical framework was guided by prior research within this field, (Erten, Leight, & Tregenna, 2019), it also allowed for the research findings to be easily replicated and communicated.

The theories and prior research reviewed within this report was tested using a deductive empirical research approach. The research was guided by two key trade theories, and a plethora of other related research articles within this field. The first theory was the Ricardian Comparative Advantage theory (Dornbusch, Fischer, & Samuelson, 1977) which emphasized the need for nations to produce goods where they (the nation) had the comparative advantage over other nations. Such advantage included factors of technology and labour productivity. The second theory was the Heckscher-Ohlin theory (Deardorff, 1982) which differed from the comparative advantage theory as its recommendations to nations was to focus their productions based on factor endowments such as land, capital, and labour.

In applying a mono-quantitative research method, the research conducted an experiment, using easily accessible public data, which unveiled keen insights into the research question, and highlighted key relationships between the various independent variables and the dependent variable. The research was focused on sub-Saharan African (SSA) countries, allowing a focus to remain narrow in scope. Data from 10 countries in SSA was obtained, spanning a 10-year time period (2010-2019). The

application of a dynamic panel data analysis allowed the effective assessment of changes in intra-African trade volume over the time series, and was well-suited for the objectives. The dependent variable for this research was the gross merchandise trade with low-and middle-income countries in SSA.

The dynamic panel analysis applied was based on the model of Anderson and Hsiao, (1981)'s generalised method of moments (GMM) and the further developed system GMM introduced and popularised by Arellano and Bover, (1995) and Blundell and Bond, (1998) respectively. The use of these statistical methods, especially that of the system GMM, allowed for concerns of endogeneity, serial correlations and measurement errors that are common within panel data to be addressed. This therefore brought the introduction of lagged variables as instruments into the statistical analysis.

The dynamic panel data estimation techniques used was adequate to accommodate the dynamic nature of the dataset, including the prior observations of the dependent variable through the introduction of lagged effects. To ensure robustness across the empirical experiments conducted within this report, the fixed effect modelling technique was also conducted on the lagged variables, accounting for unobserved individual heterogeneity within the data.

The statistical framework of this research report categorised the activities that make trade liberalisation under six variables, namely trade openness, cost to trade, index of trade freedom, GDP per capita, the logistics performance index and the last included variable, the lagged gross merchandise trade with low-and middle-income countries in SSA (Gross merchandise trade). The research considered the improvement in these variables would have an effect on intra-African trade volume. The findings showed that, only the lagged gross merchandise trade variable, showed a consistent positive and statistically significant effect on gross intra-African trade volume across all statistical tests conducted.

The independent variable of index of trade freedom, which represented the effect of tariffs on intra-African trade volume, was shown to have a positive effect on increased intra-African trade volume, however this effect was not statistically significant. This empirical finding within the research report was also reinforced in existing literature within this topic (Rodriguez & Rodrik, 2000), and therefore raises areas of discussion

and consideration for governments, policy makers and economic advisors across African nations as well as the AfCFTA secretariat.

The next variable being the cost to trade, presented a position of the financial requirements needed for traders (exporters and importers) within SSA to engage in intra-continental trade. This variable showed a negative effect on the dependent variable of gross merchandise trade volume within the fixed effect statistical test conducted. Whilst this highlighted the opposite effect trade costs would have on increasing intra-African trade volumes, the results also highlighted there being no statistical significance of this variable upon the dependent variable. This was observed across all approved statistical tests conducted within this research. The findings of this variable becomes especially important for the developing economies of SSA to take into account, especially where there are noted increases in costs to trade, including non-tariff measures, additional border inspections, ad valorem charges and other documentary charges being applied.

The third independent or explanatory variable was the GDP per capita of a nation, which was used as a determinant in identifying the level of innovation, productivity and industrial capability of the country's within the research sample. This variable factored in the economic policies and principles applied by countries across various factors of production, thereby influencing demand and supply of products for trade. The research showed GDP per capita had a positive relationship with gross intra-African trade volume, albeit not statistically significant. Once again, this finding should pique the interest of economists, policy makers and analysts on considering the implications of this findings, especially where their interests lay in developing the factors that could lead to increased intra-African trade volume.

The next variable, being the LPI, brought into account the investments and efficiencies of the logistics infrastructure and systems that are directly involved in the facilitation of intra-African trade within SSA. The research report found that, whilst the LPI index itself also showed a positive relationship in supporting gross merchandise trade, within the fixed effect analysis, the coefficient was not statistically significant. It is worth noting that the factors that are included in determining the LPI include the customs processes and procedures followed to ensure compliant trade actions by importers and exporters (Rezaei, van Roekel, & Tavasszy, 2018).

The fifth variable which this research considered as contributory towards trade liberalisation, was trade openness. This variable was also referred to as trade (% of GDP) as is reported within the World Bank databases, and is representative of the degree to which trade contributes to the overall GDP of a country. This variable, was in previous literature equated as a measure of trade liberalisation of a country (Alam & Sumon, 2020), of which this research argued otherwise.

The findings of this research report showed that trade openness has as positive effect on gross merchandise trade and this was observed across all the accepted statistical tests conducted within this report. Furthermore, the coefficients of trade openness was shown to be statistically significant within the differenced GMM model and the fixed effect model. This highlights the relevance of increased trading activities of an economy in developing and improving the volume of gross merchandise traded within Africa. This empirical finding is also reinforced in the literature of Burange, Ranadive, and Karnik, (2018) which elevated the effect of trade openness in promoting structural changes to economies with trade driving economic growth.

Finally, the last variable, which was introduced into the research as a possible factor that could influence the gross merchandise trade, was the lagged gross merchandise trade with low-and middle-income countries in SSA. This variable proved to have a positive effect, and was statistically significant in increasing intra-African trade volume. Effectively, this provided empirical evidence to the existing body of knowledge that, prior intra-African trade performance within SSA, was the most significant variable towards a positive increase in regional trade across the continent. Cumulatively, this highlights the incremental need in improving existing trading networks across the region in order to build stronger trade relations.

The holistic findings within this research report is in alignment with a similar research position put forth by Ben-David and Loewy (1998), who suggested the gains of trade liberalisation are observed in the long-term, and eventually leads to economic growth through increased trade. It underscores the importance of fostering and nurturing established trade relationships and expanding trade activities over time to stimulate intra-African trade growth. The multiple independent variables within this report all showed positive effects on increasing intra-African trade volume, although these were not statistically significant. The exception of the cost to trade; which showed an inverse

effect, indicated the need for reduced costs to trade in order to see increased contributions to trade volume.

The research findings underscored the need for an active engagement by MNCs that hold significant market share in domestic markets, to actively engage further with the firms involved within their local value chains. The MNCs involvement in these chains, particularly in SSA, plays a pivotal role in enhancing and increasing the capabilities for local production and industrialisation. Additionally, governments in the region must prioritise reformations in areas such as land rights, labour regulations, and access to finance, to support small and medium-sized enterprises (SME) to be more involved in intra-African trade.

These steps are crucial for scaling up intra-African trade volume and fostering economic growth in the region, which is also in alignment with the recommendations of Obeng-Odoom (2020)'s work. To catalyse the expansion of trade within SSA, addressing structural impediments and enabling an environment conducive to trade and investment becomes paramount. The implementation of trade liberalisation initiatives in SSA has often faced many periods of frequent policy reversals and/or disruptions (Epaphra & Amin, 2022), which consequently negates any gains and opportunities for increased intra-African trade over the long term. This is a challenge that needs to be resolved by governments and policy makers.

Dai, Yotov and Zylkin, (2013) expressed within their research that, trade volume increases between countries that are signatory to the same RTA. The research findings from this report raises additional questions on the factors that lead to such trade volume increases. This demands further consideration by academics, policy makers and governments to consider the cumulative variables that would have significant positive effects on increasing intra-African trade volume.

A key inference from this research report highlights the point of increased trade volume among African nations does not take place in a vacuum. As pointed out within Facchini, Silva and Wilmann, (2021)'s research, countries need to resolve the challenges of income inequalities using trade, and consequently increase the participation of local businesses in regional trade engagements over the long term. Further research on the best means and approached to build this is thereby recommended.

As a call to action based on the findings of this report, researchers and academics are encouraged to investigate the factors that contribute to trade volume increases over the short term, such that, SMEs increasingly engage in intra-African trade. MNCs also need to continue to develop and engage with local firms within their various value chains. This contributes towards building local production and industrialisation with these firms, and increase intra-African trade over the medium term. Finally, governments and policy makers need to prioritise the reformations in land rights, labour regulations and access to finance for local businesses.

These structural reforms would support the building of an enabling environment that encourages intra-African trade. Overall, it is critical that increased intra-African trade volume be part of a broader effort to reduce income inequalities.

7.1 Model Summary of Research Findings and Recommendations

In summary of the findings of this research article, **Figure 9** below provides a visual overview of the observations made based on the empirical and theoretical analysis made, along with some of the recommendations needed to be taken by policy makers, governments and other key stakeholders. The model describes the present theoretical status quo indicating that, trade liberalisation leads to increased intra-African trade volume over the long term.

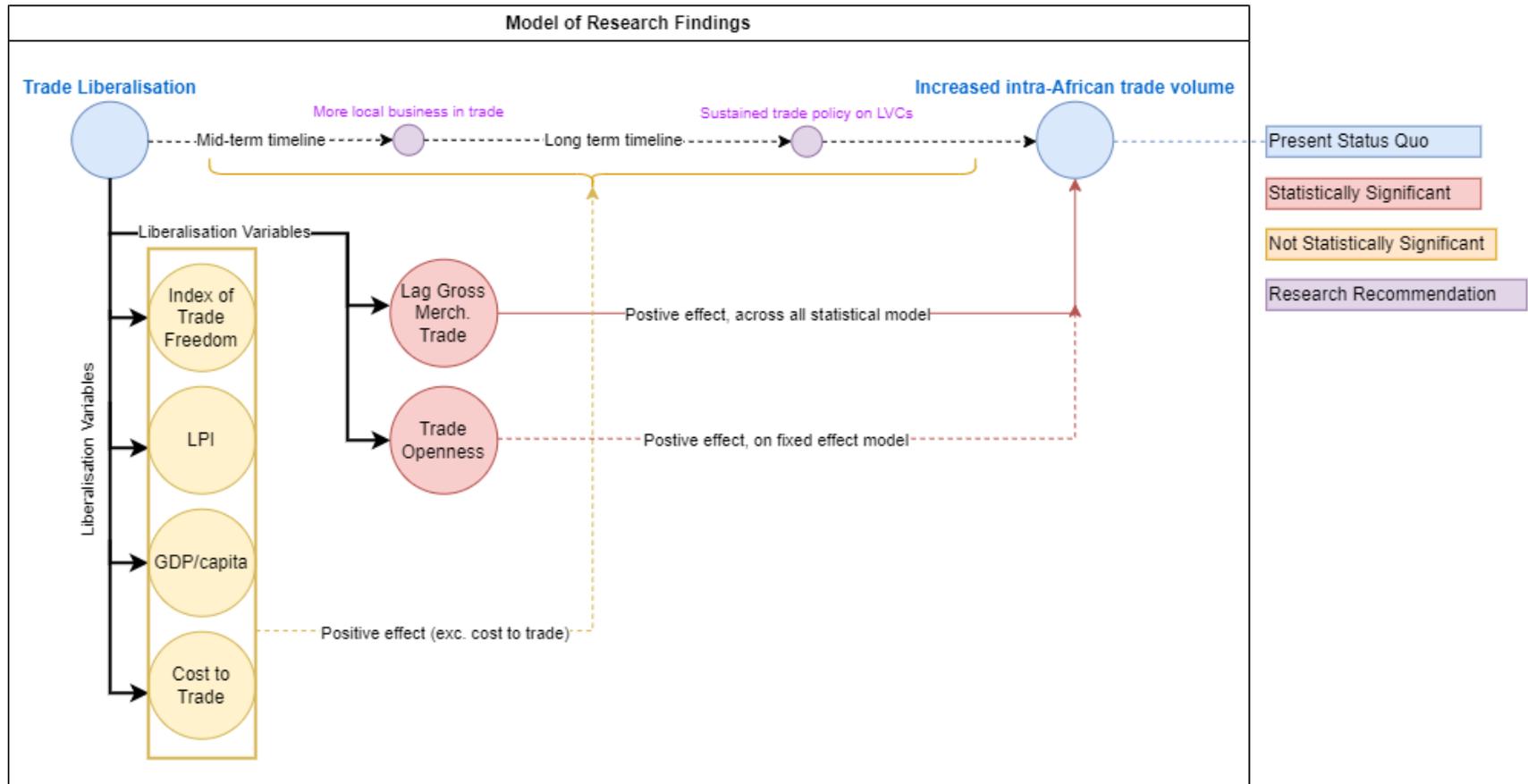
This research's contribution to the existing library of knowledge highlights the six components that make up trade liberalisation. Four of these variables, namely index of trade freedom, the LPI, GDP per capita and cost to trade, are shown to have a positive effect on increased intra-African trade volume, (with the exception of cost to trade which has an inverse relationship), however are shown to not be statistically significant.

The variables of lagged gross merchandise trade with SSA, which is equated to represent increased intra-African trade volume, and the variable of trade openness, are both shown to be statistically significant and have a positive effect on intra-African trade volume. The research finds that the lagged gross merchandise trade variable is significant across all statistical models applied, and the variable of trade openness is only statistically significant on the fixed effect model.

This research finds that, the increase in intra-African trade volume is achieved only over the long term (Ben-David & Loewy, 1998), as such recommends for governments, policy makers and future researchers, pay heed towards increasing the number of local businesses involved in formalised intra-African trade over the mid-term time period, as well as ensure trade liberalisation policies and initiatives are sustained over the long term period (Epaphra & Amin, 2022).

Local businesses and the development of value chains under the already identified priority sectors under the AfCFTA should continue to be supported towards this end. These are the sectors of agriculture and agro-processing, logistics and transportation, pharmaceuticals, automotive sectors (World Economic Forum, 2023). The inclusion of more local firms in trade related endeavours, within an environment that facilitates trade could contribute towards the reduction of income inequalities among African nations (Facchini, Silva, & Willmann, 2021).

Figure 9 - Model of Research Findings



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Appendix

A. MNC contribution to SSA GDP – GNI versus GDP

Data Source	World Development Indicators
Last Updated Date	25/07/2023

Country Code	Indicator Name	2018	2019	2020	2021	2022
SSF	GNI (current US\$)	1,712,787,132,425.23	1,765,414,984,755.13	1,666,012,377,298.19	1,865,731,900,862.40	1,984,686,900,712.76
SSF	GDP (current US\$)	1,774,221,939,062.45	1,823,372,470,680.00	1,714,053,357,042.69	1,926,457,861,345.46	2,047,347,019,065.53
	%Diff. between GDP & GNI	3%	3%	3%	3%	3%
	MNC contribution to GDP	61,434,806,637.22	57,957,485,924.87	48,040,979,744.50	60,725,960,483.06	62,660,118,352.76