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DEEP PREFERENTIAL TRADE AGREEMENT AND SUSTAINABLE
DEVELOPMENT IN AFRICA

BY
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Economics, College of Humanities and Legal Studies, University of Cape
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Philosophy degree in Economics.

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DECLARATION

Candidate's Declaration

I hereby declare that this thesis is the result of my original work and that no part of it has been presented for another degree in this university or elsewhere.

Candidate's Signature..... Date.....

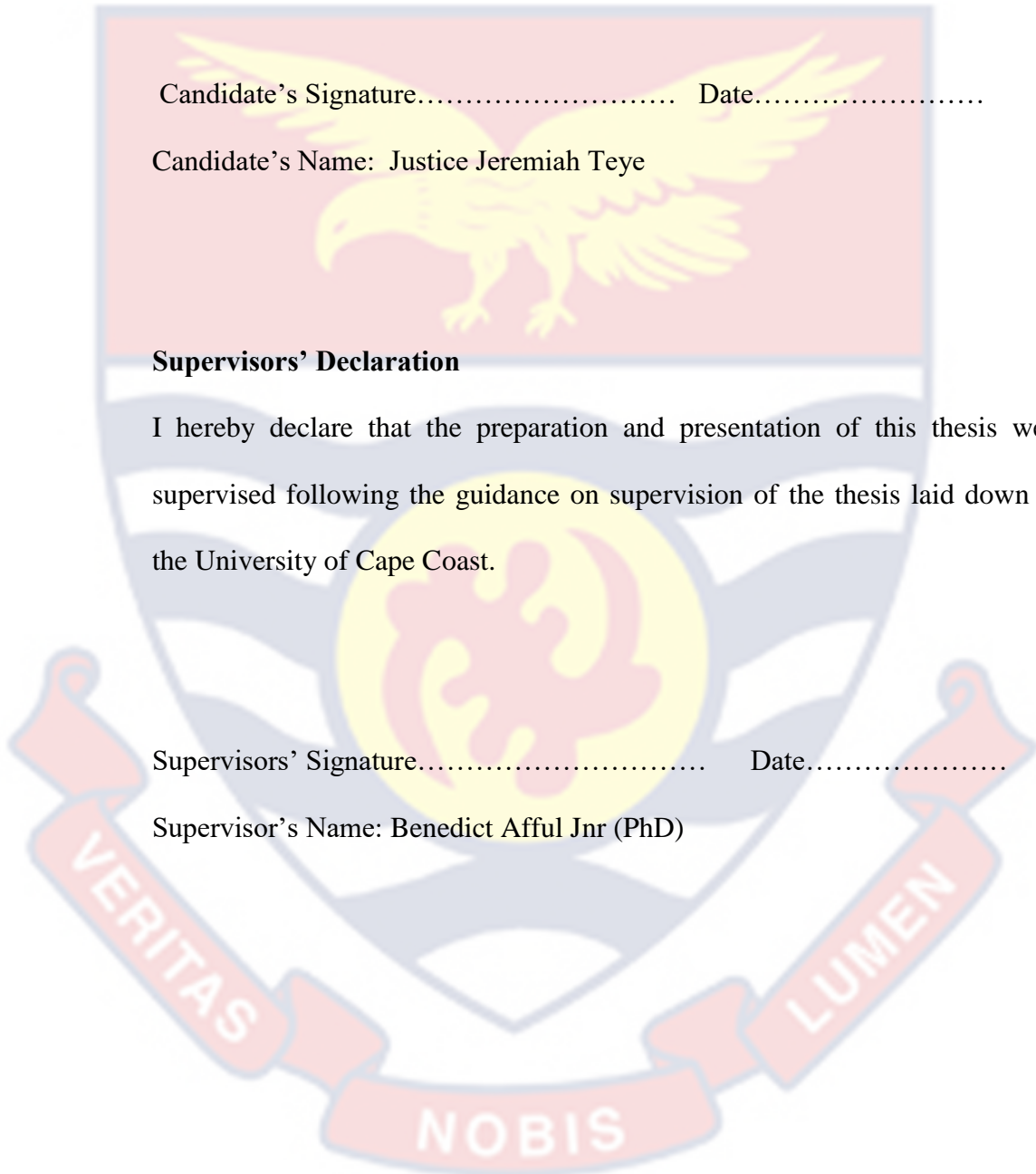
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Supervisors' Declaration

I hereby declare that the preparation and presentation of this thesis were supervised following the guidance on supervision of the thesis laid down by the University of Cape Coast.

Supervisors' Signature..... Date.....

Supervisor's Name: Benedict Afful Jnr (PhD)



ABSTRACT

The trend towards the expansion of preferential trade agreements (PTAs) is becoming more and more apparent. Traditional PTAs that rely on border terms are transitioning to deep PTAs that include high border terms and a variety of post-border terms, but the relationship between deep PTAs and sustainable development has not received significant attention. Using a data from 1990 to 2021 in 23 selected African countries, the study empirically examined the impact of deep PTAs on sustainable development, economic, environmental, and social dimensions of sustainable development in Africa by using bootstrapped quantile regression. The results show that deep PTAs have a positive impact on sustainable development, the economic and social dimensions of sustainable development. Again, the results also show that deep preferential trade agreements have a negative impact on the environmental dimension of sustainable development. This study highlights the importance of deep PTAs for improving sustainable development and provides new ideas for governments to assist in the formulation of policies that can effectively improve their development. The study therefore recommends that governments should actively engage in negotiations with potential partners, and strengthen trade agreements that include measures for deeper integration. The study also recommended governments should manage urbanisation through urban design that prioritises sustainable development, such as investments in renewable energy sources, and the implementation of effective environmental policies.

KEYWORDS

Africa

Deep Preferential Trade Agreement

Environmental Provisions

Labour Provisions

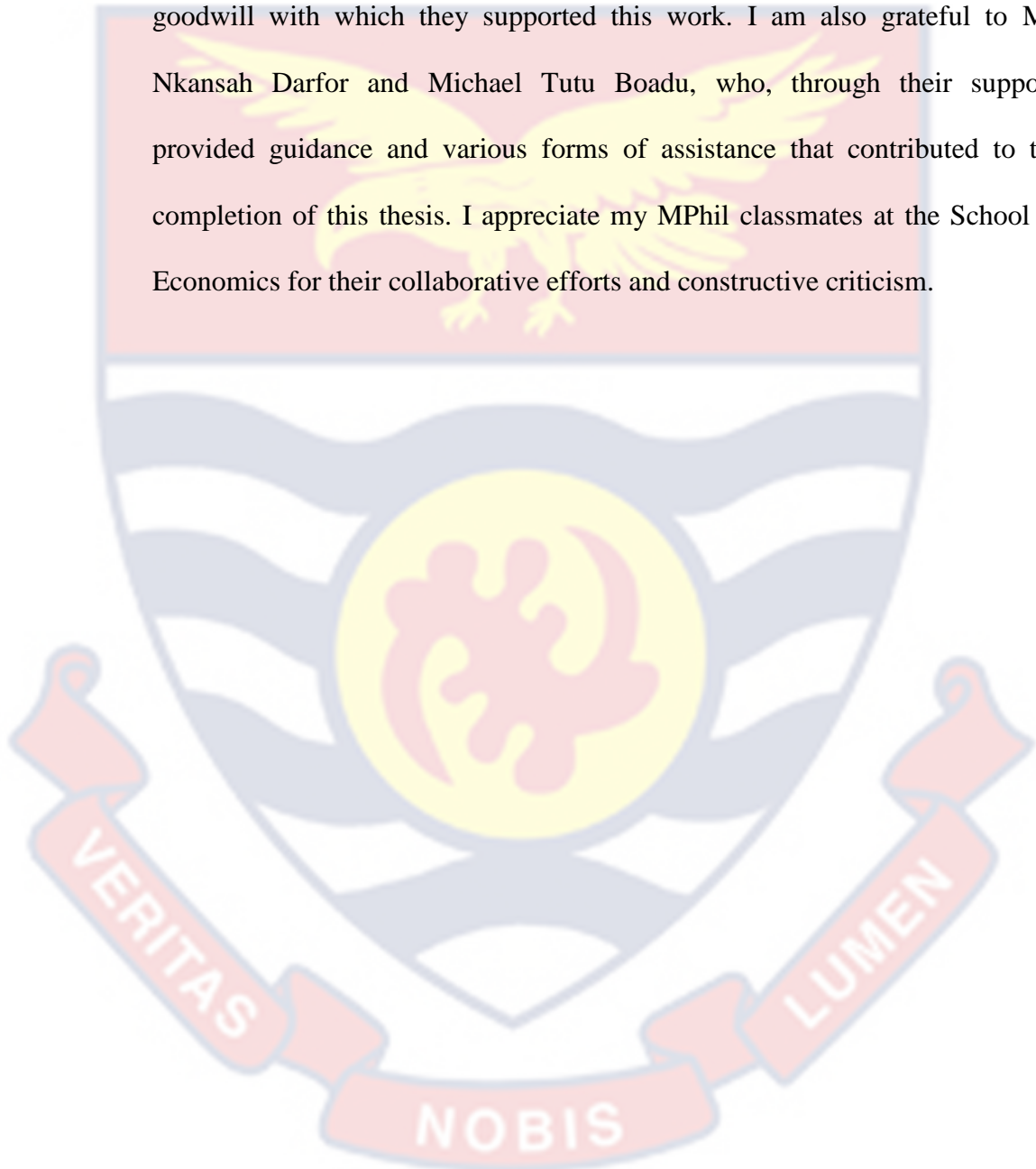
Sustainable Development

Dimension of Sustainable Development



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DEDICATION

To my parents



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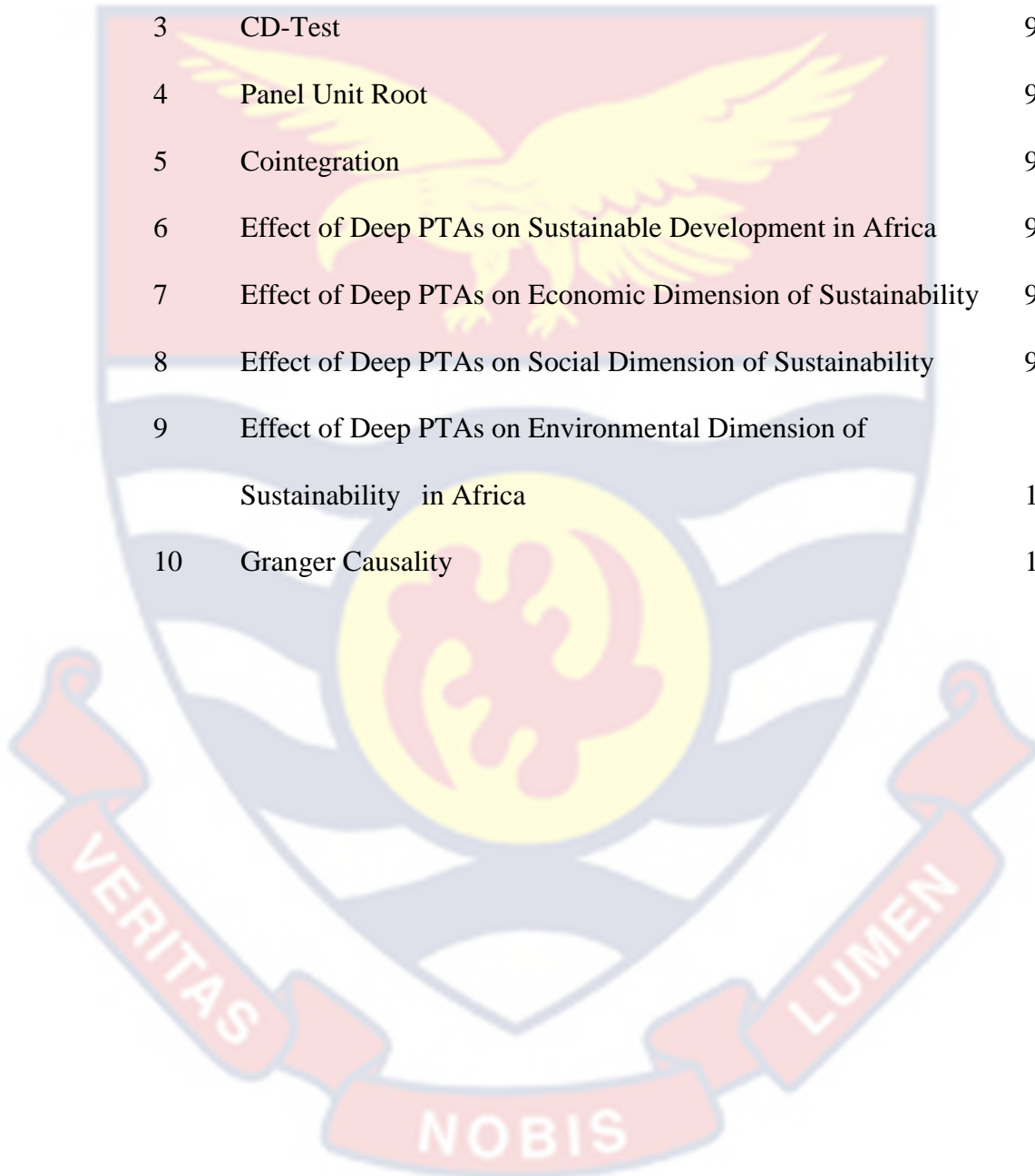
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LIST OF ABBREVIATIONS

AfCFTA	Africa Continental Free Trade Area
DPTA	Deep Preferential Trade Agreement
PTA	Preferential Trade Agreement
WTO	World Trade Organisation
ECOWAS	Economic Community of West African State
ETLS	ECOWAS Trade Liberalisation Scheme
CET	Common External Tariff
ERP	Environmental Related Provision
QR	Quantile Regression
ILO	International Labour Organisation
COMESA	Common Market for Eastern and Southern Africa
SADC	Southern African Development Community
AGOA	African Growth and Opportunity Act
EU-ACP	European Union, Africa Caribbean, and Pacific
EAC	East Africa Community
FTA	Free Trade Agreement
SDG	Sustainable Development Goal
MDG	Millennium Development Goal
LABPTA	Labour Provisions in Preferential Trade Agreements
EU	European Union
OECD	Organisation for Economic Co-operation and Development
FDI	Foreign Direct Investment
RTA	Regional Trade Agreement
LCI	Labour Compact Index

GDP	Gross Domestic Product
CDF	Cumulative Distribution Function
GS	Genuine Saving
EI	Environmental Index
HDI	Human Development Index
GDPpc	Gross Domestic Product per capita
WDI	World Development Indicators



CHAPTER ONE

INTRODUCTION

Background to the Study

Trade refers to the exchange of goods and services between countries and regions. It is a crucial aspect of the global economy. However, a preferential trade agreement (PTA) is a trade agreement between two or more countries that seeks to facilitate the exchange of goods and services through the reduction or elimination of tariffs, quotas, and other trade barriers on certain products. Preferential Trade Agreements (PTAs) are intended to foster closer economic connections between participating nations, and they are unilateral in nature. All WTO member countries have signed at least one preferential trade agreement, and these agreements have evolved to include a wide range of policy areas beyond traditional trade policy.

While PTAs initially focused on tariff reductions and obligations in areas covered by the WTO, such as customs administration, they now extend into new domains like investment, labour, environment, and competition policy (Horn et al., 2010). These more comprehensive PTAs, known as deep PTAs, have become the subject of intense policy. According to the WTO Preferential Trade Agreements Database, the number of global PTAs has increased from 50 in 1990 to 355 in December 2021. This is because trade has the potential to affect economic growth, create jobs, and increase prosperity. And that is why the government enters into a trade agreement (Obeng et al., 2023).

The deep preferential trade agreements contain regulations for each of the provisions. These provisions play a crucial role in the achievement of

development at large. In 2022, Liu et al. (2022) emphasised that the deep regional trade agreements as a form PTA has a significantly negative impact on the average annual exposure to fine inhalable particles, with diameters that are generally 2.5 micrometers and smaller (PM_{2.5}). This indicates that deep PTAs can lead to a reduction in air pollution, which can have positive effects on residents' health. This therefore implies that the deep PTAs enhance development.

The concept of sustainable development according to Brundtland (1987) aims to meet present needs without compromising the ability of future generations to meet their own needs, encompasses economic, environmental, and social development. It is about balancing economic, social, and environmental considerations to create a better world for everyone. According to Globalisation and Livelihood Options for People Living in Poverty, economic development emphasises long-term growth, resource allocation, and stability, while social dimension of sustainability focuses on well-being, and addressing poverty, inequality, and social exclusion. Also, environmental dimension of sustainability focuses on conserving natural resources and ecosystems, minimising pollution, conserving biodiversity, and mitigating climate change. The 2030 Agenda for Sustainable Development, consisting of 17 Sustainable Development Goals (SDGs), covers a range of indicators comprising three interrelated goals of sustainability (Resolution, 2015). Africa, however, has its own framework, the Africa Agenda 2063, which aims for long-term socioeconomic transformation (Ndizera & Muzee, 2018). To achieve the goals outlined in both the 2030 Agenda and the Africa Agenda 2063, international trade plays a significant role in achieving them, and

effective coordination and integration of international policy regimes are also necessary. This includes addressing trade-related challenges, climate change mitigation, deforestation, inequalities, and biodiversity conservation. The issue of sustainable development has become relevant because there is conflicting evidence regarding the adoption and execution of comprehensive preferential trade agreements.

Theoretically, deep PTA affect the dimensions of sustainable development through the concepts of scale, composition, technique effect, and policy credibility. In the first place, through the scale effect, as economic activity increases, output will increase, which implies that there will be enhanced economic growth. This will lead to job creation and an improved living standard, thus reducing poverty and inequalities (Grossman and Krueger (1991, 1995).

On the other hand, the channel through which PTAs affect sustainable development is through the composition effect. Trade agreements can influence the structure of trade by promoting or discouraging certain industries or products. Agreements that prioritise sustainable industries such as renewable energy or eco-friendly technologies can result in a shift in the composition of international trade towards more sustainable industries. This can contribute to environmental dimension of sustainability by decreasing greenhouse gas emissions, promoting resource efficiency, and protecting biodiversity. Again, trade agreements can influence the exports and imports of a country.

Trade agreements can contribute to economic development by encouraging the export of high-value and knowledge-intensive products. This

can contribute to the diversification of the economy, the creation of higher-skilled jobs, the transfer of technology and innovation, and the creation of jobs. Again, trade agreements affect sustainable development through the technique effect. Trade can contribute to environmental cleansing by tightening pollution policies. By promoting resource efficiency, facilitating the transfer of technology, encouraging innovation and research, and ensuring product quality and safety, these effects enhance production, boost productivity, and encourage the adoption of eco-friendly and socially responsible practices, which in turn sustain the environment without destroying it, improve growth, and protect workers (Levinson, 2015).

However, another crucial channel through which trade agreements can affect foreign direct investment and exports is through policy credibility as a result of joining the agreement, which implicitly affects sustainable development. Therefore, when a government becomes a member of a preferential trade agreement, it agrees to adhere to all the obligations and requirements outlined by the agreement. It is important to note that if governments do not adhere to the obligations in an attempt to loosen the agreements, it will still have an impact on sustainable development. This commitment is particularly important for PTAs that include environmental and labour provisions, as these provisions typically require the government to enforce stringent regulations. Martin and Maskus (2001); Maskus (1997) revealed that weak labour standards often distort the market and have detrimental consequences on a country's productivity, export performance, and overall economic well-being.

Similarly, according to Panagariya (1999), preferential trade agreements will promote economic progress, reduce poverty, promote social inclusion, and promote environmental dimension of sustainability through increased market access, investment, and export opportunities. This is consistent with SDG 8 and Africa Agenda 2063's goal of inclusive and sustainable economic development.

Empirically, researchers have examined the effect of a deep preferential trade agreement on sustainable development by looking at either the economic, social, or environmental dimensions. For instance, Obeng et al. (2023) examined the impact of deep preferential trade agreements (PTAs) on export efficiency in Ghana, taking institutional quality into consideration. The authors rely on panel data from 44 African nations, with Ghana receiving special attention. The export efficiency is estimated using stochastic frontier analysis. The researchers argued that deep PTAs lower the export efficacy of Ghana. This implies that deep PTA deteriorates economic development. In contrast to the findings of Lee and Kim (2022); Obeng et al. (2023) analysed the effect of deep preferential trade agreements (PTAs) on global value chain (GVC) trade flows from 1995 to 2015. They analysed the data using a sophisticated gravity model with three-dimensional fixed effects. Their research demonstrated that PTAs have an overall positive impact on GVC trade flows, which improves economic development.

Moreover, Kox and Rojas-Romagosa (2019) also found that deep preferential trade agreements (PTAs) positively impact foreign direct investment (FDI) flows, affecting economic development in host nations. The study found a favourable relationship between PTAs and FDI, with larger

effects on broader policy areas and investment provisions. Deep PTAs promote FDI from countries already investing in the host country, stimulating innovation and competitiveness and thereby enhancing economic development.

Again, Berger et al. (2020) examined the trade effects of environmental provisions in preferential trade agreements (PTAs) and their contribution to achieving sustainable development objectives. They studied the impact of environmental provisions on bilateral trade flows using a quantitative research strategy and a gravity model. The researchers argued that environmental provisions are associated with less trade among trade partners compared to PTAs that include less or no environmental provisions. Martínez-Zarzoso and Oueslati (2018) also studied the link between deep comprehensive and regional trade agreements and air pollution, examining OECD nations from 1999 to 2011. They found that regional trade agreements with environmental provisions positively impact air pollution reduction and align emissions levels. These provisions can lead to more stringent regulations and enforcement, ultimately reducing environmental damage.

Moreover, Liu et al. (2022) reported the effect of a comprehensive preferential trade agreement on social sustainability. In the study, the authors employed a quantitative analysis based on data collected from 2009 to 2017 from 786,040 observations in 143 countries, as well as the fixed effect and stepwise regression techniques. Regional Trade Agreements (RTAs) can have a significant and positive impact on the health of residents, according to the author. This suggests that increasing the number of RTAs may improve the health of a city's residents. Similar to the work by Liu et al. (2022), Chang and

Wu (2016) published "Preferential Trade Agreements, Income Inequality, and Authoritarian Survival," which was also a quantitative study. From 1960 to 2006, data was collected from seventy-plus authoritarian regimes. The researchers argued that preferential trade agreements reduce economic disparities, thereby enhancing the welfare of low-income workers. This leads to an improvement in the well-being of the workforce, which in turn improves development.

There is no doubt that the above argument has some validity. A deep preferential trade agreement can lead to various effects on the environment, social, and economic development, including a potential reduction in inequalities, prevention of environmental pollution, and increased gross domestic product.

While deep PTAs have the potential to support sustainable development, they can also have adverse effects on the environment and social development if not properly designed and implemented (Ndulu, 2007). Similarly, international trade agreements can also have adverse impacts on environmental and social welfare, including carbon leakage (CO₂ emission displacement) Feng et al. (2013), loss of biodiversity, and deforestation (Liu, 2014; Smith, 2006). It may also exacerbate the environmental and socio-economic disparities that exist between developed and developing countries, which will undermine local industries and agricultural production (Goosen et al., 2008; Thompson-Lipponen and Greenville, 2019).

In Africa, the recent establishment of the African Continental Free Trade Agreement (AfCFTA) may become one of the most significant intra-regional trade agreements in the annals of African intra-regional trade policy.

The primary purpose of the AfCFTA is to unify intra-regional trade agreements in Africa into a single market for the exchange of goods and services. Since the agreement's implementation on January 1, 2021, a number of African nations have signed and ratified their participation. The optimism surrounding the AfCFTA stems from the potential role it could play in expanding economies. Among the notable regional integration agreements in Africa are the Economic Community of West African States (SADC), the Common Market for Eastern and Southern Africa (COMESA), the African Growth and Opportunity Act (AGOA), and the East African Community Common Market.

Additionally, cooperation between the European Union, Africa, the Caribbean, and the Pacific (EU-ACP) and SADC is noteworthy. To illustrate, the ECOWAS Trade Liberalisation Scheme (ETLS), instituted in 1979 with the aim of attaining economic integration, initially prioritised unprocessed, agricultural, artisanal, and handcrafted products. In 1990, however, it was expanded to include industrial and processed products. The ETLS is implemented in accordance with ECOWAS protocols and conventions, particularly those pertaining to origin regulations and the free movement of people, goods, and transportation. On January 1, 2015, the ECOWAS Common External Tariff (CET) went into effect. To qualify for the ETLS, products must meet three requirements: at least 60% local content, at least 30% value-added, and a change in tariff headings as indicated by the harmonised system. These agreements, particularly the AfCFTA, have increased Ghana's total trade by US\$ 148.3 million and consumer welfare by US\$ 8.6 million (Bayale et al., 2022). However, trade agreements can have a

negative impact on the environment, social development, and economic development if not managed properly.

With this background, it is important to analyse the effect of deep PTAs on the economic, social, and environmental dimensions of sustainable development in Africa in a holistic manner. Understanding its effect is key to identifying the appropriate policy response that could work to maximise the benefits of deep PTAs for sustainable development in Africa.

Statement of the Problem

The discussions suggest that trade plays a vital role in African economies. Despite its positive aspects, it could also have an adverse effect on the environment, social, and economic development in Africa. In fact, studies such as Copeland (2000); Grossman and Krueger (1991, 1995); OECD have all found evidence that trade without regulation will adversely affect the environment and economic development.

In recent years, deep preferential trade agreements have emerged as a new approach that goes beyond traditional agreements by incorporating various non-trade issues such as intellectual property rights, labour standards, environmental, investment, and social protection (Horn et al., 2010). The labour standards, and environmental agreements encompass sustainability clauses, regulatory provisions, and governance provisions that aim to address environmental and social concerns, technical regulations and standards, and enforcement and dispute resolution.

The sustainability clauses seek to encourage sustainable development and address environmental and social issues; regulatory clauses also address technical regulations and standards; and governance provisions address trade

agreement enforcement and dispute resolution. According to Suranovic (2002), labour and environmental provisions is the only way to assure that international trade remains fair. It is also important to note that, 63% of all post 1945 preferential trade agreement (PTAs) cover at least one provision regulating environmental protection or labour rights (Lechner, 2018).

Indeed, sustainable development requires a balanced consideration of economic, social, and environmental considerations (Brundtland, 1987). The pursuit of sustainable development in Africa has resulted in the formation of PTAs that promote economic growth while addressing social and environmental concerns. These provisions align with the Sustainable Development Goals and Africa's Agenda 2063. Milewicz et al. (2018) emphasise that these provisions can have both positive and negative effects on sustainable development.

While labour and environmental provisions have historically been examined separately, recent research highlights their interdependence by looking at their impacts on sustainable development (Barry and Reddy 2008; Johnson, 2015; Zelli et al., 2013). The inclusion of environmental and labour provisions in preferential trade agreements, whether bilateral or regional, signifies significant progress. Although previous studies have examined the effects of deep preferential trade agreements on sustainable development in Africa, they focused on a single aspect of sustainable development, be it the economic, social, or environmental aspect.

For instance, Berger et al. (2020); Obeng et al. (2023) concluded that deep PTA negatively affects economic dimension of sustainability by reducing exports. In contrast, Lechner (2018) also argued that deep trade agreements

positively affect economic development by increasing foreign direct investment. Again, according to Martínez-Zarzoso and Oueslati (2016); Zhou et al. (2017), they both agreed that deep preferential trade agreements positively reduce air pollution. Novitz (2018) also concluded that trade agreements improved social development by protecting workers, their rights, and maintaining good working conditions. They all looked at the impact of trade agreements on a single dimension of sustainable development.

However, to the best of my knowledge, there is no work that comprehensively evaluates the impact of deep trade agreements on sustainable development, and the multiple dimensions of sustainable development in Africa at the same time. By then, that will not help achieve the true aspect of sustainable development. Specifically, it is crucial to explore and understand the varying effects of deep preferential trade on Africa's sustainable development in order to make informed decisions regarding international trade agreements and developmental issues. This therefore remains a significant gap in understanding the effects of deep PTAs on sustainable development and all three dimensions of sustainable development in the African context.

To fill this gap, this study therefore aimed to expand knowledge by analysing the effect of deep PTAs on sustainable development, and also considering the economic, social, and environmental dimensions collectively.

Purpose of the Study

The purpose of this study is to investigate the effects of deep PTAs on sustainable development and the economic, social, and environmental dimensions of sustainable development in Africa.

Research Objectives

The specific objectives of the study are to:

1. Estimate the effect of deep PTAs on sustainable development in Africa.
2. Examine the effect of deep PTAs on the economic dimension of sustainable development in Africa.
3. Access the effect of the deep PTAs on social dimension of sustainable development in Africa.
4. Examine the effect of deep PTAs on environmental dimension of sustainable development in Africa.

Research Hypothesis

1. H_0 : Deep PTA has no significant effect on sustainable development in Africa
 H_1 : Deep PTA has significant effect on sustainable development in Africa
2. H_0 : Deep PTA have no significant effect on the economic dimension of sustainable development in Africa
 H_1 : Deep PTA have significant effect on the economic dimension of sustainable development in Africa.
3. H_0 : There is no significant impact of deep PTA on social aspect sustainable development of in Africa.
 H_1 : There is a significant impact of deep PTA on social aspect sustainable development of in Africa.
4. H_0 : Deep PTA has no significant effect on environmental development in Africa.

H_1 : Deep PTA has a significant effect on the environmental development in Africa.

Significance of the Study

Deep preferential trade agreements are necessary for development, especially in this period of globalisation and rising environmental issues. Although some studies have been done, the impact of deep PTA on sustainable development, considering the economic, social, and environmental aspects, collectively lacks attention. As a result, this research is regarded as significant. The goal is to raise awareness of the importance of the provisions in the trade agreement. The study is aimed at bridging the academic gap in the literature, which is ideally supposed to be a reference point for policymakers in Africa. The findings of the study will help authorities make policies and strategic decisions that will improve social, economic, and environmental development.

The study's recommendations would include suggestions for policymakers to design and implement PTAs that prioritise sustainable development and improve the coherence between trade policies and sustainability goals at the national level. This research would also serve as a foundation for future studies and provide secondary motivation and success data for researchers and academics.

Delimitations

1. Geographical scope: The study focus on a specific region or group of African countries, rather than examining the entire continent.
2. Period: The study focus on a specific period or era in African economic development.

4. Economic sectors: The study focus on a specific sector, rather than all sectors.

Limitations

1. Data availability: The availability of data on deep PTAs and their impact on sustainable development in Africa may be limited, which may affect the quality and accuracy of the research.
2. Causality: Determining the causality between deep PTAs and sustainable development in Africa may be challenging due to the presence of other variables that can impact sustainable development.
3. Interpretation of sustainability: The interpretation of what constitutes sustainable development may differ among stakeholders, which may impact the study's findings and conclusions.

Definition of Terms

1. Deep Preferential Trade Agreement: Refers to the degree and scope of the obligations and measures included in the agreement thus the environmental and labour provisions that go beyond tariff reduction or abolition. It assesses how far the agreement goes beyond simply lowering trade barriers to include other aspects of trade-related laws and regulations
2. Sustainable Development: ensuring that the ability of future generations to fulfil their own requirements is not compromised while fulfilling the needs of the present.
3. Investment: The allocation of resources, such as money, time, and effort, into an activity or project with the expectation of generating income or other benefits in the future.

4. Labour Standards: Rules and regulations that govern the conditions of work, such as minimum wages, working hours, and safety standards, to promote fair and decent working conditions for employees
5. Environmental Protection: consists of programs designed to reduce environmental hazards posed by contaminants such as hazardous materials and wastes, fuels, and oils.
6. Trade liberalization: refers to the elimination or reduction of trade barriers between nations in order to facilitate the free exchange of commodities and services. Tariffs, import quotas, embargoes, and non-tariff barriers are trade barriers.

Organization of Study

The study comprised six chapters. The first chapter examined the study's context, problem statement, research objectives and significance, limitations, and organisational structure. In the second chapter, an overview of the PTA and sustainable development was presented. The third chapter examined the available literature on the environmental and labour provisions of the PTA and their relationship to sustainable development. The fourth chapter described the study's research methods, including population size, sample size, and sampling techniques, as well as data acquisition and analysis procedures. The fifth chapter also included the results and discussion based on the research queries. The sixth chapter provides a summary, conclusions, and recommendations, as well as direction for future research.

CHAPTER TWO

OVERVIEW OF DEEP PREFERENTIAL TRADE AGREEMENT AND SUSTAINABLE DEVELOPMENT

Introduction

This Chapter provides an overview of the deep preferential trade agreement and sustainable development.

Preferential Trade Agreement

According to Zelli et al. (2013), a preferential trade agreement is a type of trade pact between countries that grants signatory states privileged access to particular trade commodities or services, typically by lowering or removing tariffs or other trade barriers. In Africa, there are several preferential trade agreements in place. Some examples include: SADC, EAC Common Market, AfCFTA.

In 2018, 44 African Union member states signed the African Continental Free Trade Area (AfCFTA), with four others joining subsequently. The agreement seeks to establish a single market for goods and services across the entirety of Africa, a continent with a combined GDP of more than \$3 trillion and a population of 1.2 billion. The AfCFTA aims to increase intra-African trade by removing tariffs and non-tariff barriers, fostering regional integration and economic development, and creating job opportunities. The largest free trade area in the world was established on January 1, 2021, when the agreement entered into force. African businesses may benefit from the AfCFTA, but there are obstacles to overcome, such as infrastructure development, the harmonisation of trade laws and regulations, and political and security concerns. The AfCFTA is regarded as a positive

development for the African continent, as it can foster inclusive economic growth and promote sustainable development in the region.

However, in 2010, Tanzania, Kenya, and Uganda established the East African Community Common Market, which was later joined by Rwanda and Burundi (Milewicz et al., 2018). The objective is to promote the unrestricted movement of capital, people, goods, and services within the region. The Common Market Protocol identifies the unrestricted movement of goods, services, capital, and labour as its four primary areas of cooperation. This has enhanced the region's commercial and investment prospects and its economic outlook. There are several advantages to the EAC Common Market, such as increased competitiveness and efficiency, but there are also challenges, such as inconsistent legislation and the need to improve infrastructure. The EAC Common Market is viewed as an important step forward for the region, with the potential to resolve certain persistent economic issues.

The 16 members of the Southern African Development Community (SADC) founded the SADC Free Trade Area (FTA) in 2008 to create a free trade zone in Southern Africa. The major goals are to stimulate industrial growth and economic integration while removing tariffs on items that act as trade obstacles. The FTA includes clauses regarding rules of origin, dispute resolution procedures, and customs cooperation. The SADC FTA may provide advantages for businesses, including cheaper access to a greater variety of commodities and new markets. However, issues including disparities in development levels, poor infrastructure, and non-tariff obstacles must be resolved.

These agreements provide businesses the ability to reach out to new clients and broaden their reach while boosting economic growth and opening up markets to more trade and investment.

The Environmental Provision in PTAs

It is not uncommon for environmental clauses to be included in a variety of agreements. The 1957 Rome Treaty, which established the European Economic Community, was the first PTA to include an environmental provision. This convention permitted parties to restrict imports, exports, or products in order to protect the health and lives of animals or plants, so long as the restrictions were not arbitrary or discriminatory. Between 1956 and 2016, 274 (93%) of 295 PTAs contained at least one environmental-related provision (ERP). The World Trade Organisation (WTO) classifies these 274 PTAs as 143 North-North PTAs, 108 North-South PTAs, and only 23 Developing Country PTAs (South-South PTAs).

Between 1990 and 2005, there were more agreements with environmental provisions but fewer individual environmental-related provisions included within those agreements. However, NAFTA was an exception, as it incorporated comprehensive environmental-related provisions into the environmental cooperation agreement. This agreement emphasised the effective enforcement of environmental laws and regulations, along with various environmental cooperative initiatives and institutional groups.

From 2005 to 2010, the prevalence of PTAs with environmental-related provisions increased, particularly with the expansion of North-North and North-South PTAs. During this time period, the number of PTAs with environmental provisions involving high- and middle-income nations

increased significantly. The Trade Promotion Agreement between the United States and Peru, for instance, included environmental language, exceptions for environmental measures, provisions on enforcement of environmental laws, compliance with international environmental agreements, and measures to enhance forest sector governance.

The number and proportion of PTAs with environmental-related provisions continued to increase between 2011 and December 2017, albeit at a slowing rate due to a decline in the number of signed contracts. Recently, the substance of environmental-related provisions in PTAs has expanded, particularly in agreements between industrialised and developing economies, despite a slower rate of PTA formulation. These agreements vary in terms of their nature, scope, objectives, goals, and other aspects. These agreements are categorised in the form of nature, scope, objectives, goals, etc. They are as follows:

Nature of environment-related provisions

Between developed nations, the majority of PTAs containing various forms of environmental provisions were initially negotiated. Over time, environmental provisions came to be incorporated into PTAs by some developing countries. Initially, these agreements were negotiated exclusively with industrialised nations. Simultaneously, several countries that had previously included environmental provisions in a subset of their PTAs discontinued doing so. This phenomenon elucidates the nonlinear correlation that exists between the quantity of signed PTAs containing environmental-related provisions and the average number of such provisions.

Environmental-related provisions in trade agreements and their scope

The magnitude, variety, and number of environmental provisions have all increased significantly over time. The majority of clauses in 270 PTAs acknowledge and/or achieve a balance between environmental and trade/investment objectives. The second and third most common categories involve environmental objectives and enforcement strategies, respectively. A growing number of PTAs include clauses addressing external support, environmental protection in general, MEA compliance, and participation in advancing environmental objectives. In addition to provisions that seek to strike a balance between environmental and trade/investment objectives, North-North and North-South PTAs typically include a broader range of environmental-related provisions.

In South-South PTAs, environmental objectives, achieving a balance between commercial and environmental objectives, and enforcement methods are frequently included. Since the majority of environmental provisions establish obligations outside the scope of WTO agreements, they are by definition WTO-X (WTO plus) provisions. The environmental exception clause is the primary category of WTO-like ERPs that mimic the general exceptions under Article XX of the GATT-1994 or Article XIV of the GATS. Another WTO-like environmental-related provision is the authority to control environmental matters, which is acknowledged, for example, in the WTO agreement on trade technical barriers.

Objectives and Goals

Many PTAs now have more provisions aimed at promoting environmental goals. These clauses are usually located in the preamble or

objectives section of the agreement and call for cooperation between the parties to accomplish the objectives. Additionally, some provisions acknowledge the parties' right to regulate, which is meant to supplement these goal-oriented provisions. This trend of including more provisions related to environmental objectives is becoming increasingly common. Additional provisions may urge or obligate the participating parties to guarantee that their domestic environmental legislation offers significant levels of protection and that such protection is continually enhanced. Some PTAs take this a step further by advocating for regulatory collaboration or harmonisation in the realm of environmental rules and regulations.

Balance between environmental and investment or trade objectives

The most frequent form of environmental-related provisions entails a balance between environmental and trade or investment objectives, with the exception clause being the most prevalent form of this form. This clause enables parties to deviate from the PTA's obligations regarding environmental issues, including animal or plant protection, conservation of natural resources, etc. Some agreements also include an explicit provision for investment. An increasing number of PTAs include provisions that prohibit weakening environmental protection for the sake of promoting trade or investment.

These provisions are often accompanied by clauses that require parties to enforce environmental laws effectively and scientifically assess the agreement's impact on the environment. Some agreements allow for the liberalisation of the trade of environmental goods. Occasionally, developed and developing nations negotiate PTAs with provisions requiring parties to

consider science when implementing environmental policies and assessing environmental impacts.

General areas of environmental protection

There is a growing body of agreements that enforce obligations pertaining to particular environmental concerns, with significant variations in terminology and extent across these agreements. A number of the most prevalent provisions concerning fisheries mandate that the involved parties perform fisheries management. A growing proportion of agreements, apart from those pertaining to sustainable forest management, biodiversity, water management, renewable energy, and energy efficiency, also incorporate provisions for the protection and cessation of the illicit trade in endangered species. Less frequent clauses address the management of toxic and hazardous waste as well as substances that deplete the ozone layer.

Compliance with multilateral environmental agreements

Worldwide agreements that attempt to solve environmental issues on a national, regional, or global level are increasingly being included in regional and worldwide trade agreements as sections relating to compliance. These provisions can reaffirm the importance of specific agreements, require parties to take steps to comply with agreement obligations, or clarify the relationship between trade agreements and referenced environmental agreements. The number of such provisions tends to be greater when one party to the agreement has signed more environmental agreements than the other. Some provisions help to clarify the relationship between the agreement and MEAs in the event of inconsistencies.

External assistance

More and more preferential trade agreements (PTAs) are setting environmental cooperation as a goal. PTAs between developed and developing nations usually provide ways for technical and financial aid as well as capacity-building in environmental matters. These environmental cooperation efforts can include exchanging information, training programmes, sharing professionals, collaborating on projects, and organizing conferences. Some PTAs even include technology transfer as an example of cooperation. While some PTAs mention environmental cooperation in general terms, others specify technical cooperation on certain environmental concerns. PTAs also often note that the availability of funds and human resources affects whether these environmental cooperative activities will take place.

Participation, transparency, and cooperation in the promotion of environmental goals

A proportion of preferential trade agreements (PTAs), predominantly among high-income and middle-income countries, include provisions designed to promote engagement in the pursuit of environmental goals. Furthermore, specific PTAs that have a comprehensive environment chapter, a cooperation chapter, or a distinct agreement on environmental cooperation institute committees or institutional organisations to oversee and deliberate on the implementation.. PTA mechanisms for addressing environmental concerns vary in nature, structure, and function.

In certain US and Canadian PTAs, one of the functions is to determine whether written submissions or inquiries from a party's citizens regarding the ineffective enforcement of environmental laws merit a response from the

concerned country. Several PTAs have transparency provisions pertaining to environmental laws, regulations, and management to encourage effective participation. A common provision ensures that environmental rules and regulations are made public as quickly as possible. Another less common provision is to solicit feedback on drafts of future environmental laws and regulations. Transparency provisions can also apply to specific topics like biodiversity and forestry, and enhancing access to environmental information can be a focus of cooperation in PTAs.

Many PTAs include provisions regarding public participation in environmental decision-making, environmental impact assessment of activities, enforcement of environmental laws and policies, and implementation of environment-related programmes, in addition to transparency. Certain PTAs incorporate provisions that aim to foster public engagement by establishing advisory committees composed of commercial, environmental, and civil society organisation representatives. Concerning the implementation of the environmental chapter or environmental side agreement of the PTA, these committees offer direction. Additional provisions are designed to enhance, encourage, or fortify the capacity of the general public to engage in environmental affairs as a prospective domain for collaboration.

Enforcement mechanisms

In addition to transparency and public participation, an increasing number of trade agreements now include environmental governance provisions. These provisions obligate parties to enforce domestic environmental laws through judicial, quasi-judicial, or administrative proceedings and guarantee citizens' access to such proceedings. In addition,

there are commitments to provide effective sanctions or remedies for environmental violations, such as fines or cessation of operations. Enforcement mechanisms vary between PTAs, with some allowing retaliation against violations within a specified framework and others establishing state-to-state dispute settlement procedures for the environment chapter.

Some PTAs have special environmental state-to-state DS provisions, including the establishment of an arbitration panel with specific qualifications and timeframes for dispute resolution. Some PTAs also specify how to resolve a dispute involving an obligation under a multilateral environmental agreement that is covered. As enforcement mechanisms, the possibility of suspending trade concessions and imposing monetary sanctions varies across PTAs. While the majority of U.S. PTAs contain state-to-state DS procedures for the environment chapter and permit trade sanctions, recent European Union PTAs exclude monetary remedies and trade sanctions from DS proceedings.

In conclusion, the number of preferential trade agreements (PTAs) has increased dramatically over the past three decades, as has their environmental coverage. The majority of PTAs contain an environmental exception, but the scope and quantity of environmental-related provisions have expanded significantly, addressing issues beyond the WTO's current framework. Developed countries, particularly those with high incomes, are the primary proponents of detailed ERPs, although some developing countries that have already signed PTAs with high-income countries are increasingly incorporating environmental-related provisions into trade agreements with other developing countries. In general, the scope and extent of commitments

in these ERPs are less specific than in agreements between developed and developing nations. The evolution of environmental-related provisions in trade agreements reflects a dynamic approach, with agreements frequently serving as models for the development of new approaches to emergent issues and challenges.

Labour provision in PTAs

Labour clauses are measures included in trade agreements that aim to protect and advance employees' rights. This is accomplished through a variety of approaches, including collaboration and dialogue among trade unions, business organisations, and the general public. Over the last ten years (2011–2020), over 50% of trade agreements included labour clauses, a major rise from the previous decade (2001–2010), when the proportion was only 22%.

The content and strictness of labour laws vary depending on where in the PTA they are found. Some PTAs only state an aspirational goal to enhance working conditions in their preambles. Others specify adherence to generally accepted labour norms, with or without mentioning the pertinent ILO documents. Others go into detail about the methods used for consultation, resolving disputes, cooperating, and/or the institutions in charge of overseeing the monitoring and execution of labour-related agreements.

The five main categories of labour provisions

Labour provisions in treaties and agreements on labour are coded according to five categories, including aspirational labour goals and objectives, substance-related labour provisions, investment-related labour provisions, cooperation over labour provisions, and institutions supervising labour commitments. As a cross-cutting metric, the coding scheme

incorporates enforceability. Aspirational statements are coded separately from substantive commitments, which include fundamental rights, working conditions, international instruments, and domestic law-related commitments. Investment-related substance-related labour provisions include commitments to protect labour rights, whereas cooperation- and institution-related substance-related labour provisions are coded according to characteristics that determine the efficacy of monitoring and implementation.

Goal-oriented labour laws

The By far, the most frequent allusions to labour standards are found in preambles and objectives that discuss the creation of employment opportunities and the improvement of working conditions. In contrast, references to labour rights and working conditions remain comparatively infrequent. When comparing statements concerning the quality of jobs to those concerning the enhancement of working conditions and other labour rights and conditions, it is important to note that the former pertains to the quantity of jobs created.

Under this, two distinct forms of commitment exist.

1. Objectives regarding labour standards and the safeguarding or advancement of workers' rights.
2. Labour objectives aimed at generating employment opportunities and fostering job creation.

Workplace policies relating to substances

These provisions stem from or are linked to globally acknowledged labour commitments and regulations outlined in international treaties that bind parties

to these commitments. They are closely related to the relevant obligations under international labour standards.

1. The ILO Declaration of 1998 concerning Fundamental Principles and Rights at Work and its Subsequent Actions.
2. Freedom of association and collective bargaining rights.
3. Elimination of all forms of forced or compulsory labour.
4. Effective abolition of child labour.
5. Elimination of discrimination in respect of employment and occupation.
6. Working conditions and terms of employment.
7. Other international instruments.
8. Internationally recognised labour standards.
9. Corporate Social Responsibility.
10. Non-derogation.
11. Effective enforcement of domestic laws.

Labour laws relating to investments

Regarding laws relating to investments, the PTA mandates that investors operate in a way that promotes and protects labour standards. Although such references have increased in frequency as PTA clauses, the commitments' scope has not yet reached the level of trade-related provisions. The great majority of labour laws pertaining to investments deal with obligations relating to non-derogation, or the promise not to promote investment by weakening domestic labour standards through waivers or derogations. Only a small number of instances in the PTA's investment chapter refer to

investment-related labour provisions, whereas most of the time these agreements are found in the clauses.

1. Mandate for investors to conduct their activities in a manner that upholds and supports labour standards, either by protecting or promoting them.

Labour laws relating to cooperation

If the parties agree that they are cooperating on certain problems, then any substantive obligations will fall under the category of cooperation. In practice, collaboration often manifests as technical support and capacity building through the sharing of knowledge, expertise, resources, cooperative research, seminars, etc.

1. Reference to cooperation over labour provisions.

Labour laws relating to institutions

The last category shows three institutional characteristics that have an impact on how well labour provisions are monitored and put into practice.

They include

1. Measures that encompass the establishment of a distinct and specialised committee or contact point responsible for overseeing and implementing labour commitments.
2. Measures that involve the inclusion of third parties, such as social partners, the International Labour Organisation (ILO), non-governmental organizations (NGOs), or other external organizations, in the monitoring and implementation of labour provisions.
3. Measures that involve the requirement to conduct post-implementation assessments to evaluate the impact of labour provisions.

Enforceability as a cross-cutting concept

This is an example of a mechanism for resolving labour-related disputes under the enforcement of trade agreements. The enforceability is determined by the degree of the provisions' bindingness and whether they are subject to dispute mechanisms. Non-binding commitments have the weakest enforceability, followed by binding commitments not subject to dispute settlement, state-to-state dispute settlement, and private-state dispute settlement. Private-state dispute resolution is exclusively applicable to labour provisions concerning investments as outlined in the investment chapter of the trade agreement, it has been determined.

The enforceability of labour provisions is ascertained through legal analysis of treaty texts; the presence of terms such as shall, will, concur, undertake, assure, and realise signifies the existence of legally binding obligations. Regarding labour standards provisions, state-to-state dispute settlement permits parties to approach quasi-judicial arbitration-based dispute resolution. Private-state dispute settlement, which is infrequently applicable to labour provisions, pertains to investor-state dispute resolution as outlined in the investment chapters of trade agreements. Non-binding and best-endeavor provisions.

1. Mandatory provisions that do not undergo dispute resolution
2. Mandatory provisions susceptible to resolution through state-to-state dispute arbitration
3. Mandatory provisions susceptible to resolution through state-to-state dispute arbitration

Sustainable Development

The acceptance of the UN 2030 Agenda and Sustainable Development Goals by all 193 member nations has led to an increase in government and academic efforts to track sustainability performance, as mentioned by (Hametner & Kostetckaia, 2020). The concept of sustainable development was initially derived from ecology, but as related research progressed, it grew to incorporate the economy, society, and environment. Following Brundtland (1987) report, *Our Common Future*, sustainable development has received considerable global attention and sparked considerable controversy. The report provides the first definition of sustainable development, emphasising its ecologically oriented and intergenerational nature, defined as the development that meets the current generation's requirements while not compromising future generations' needs (Alaimo & Maggino, 2020). Despite originating in ecology, the concept of sustainable development has brought together diverse areas of study and interests, uniting environmental, economic, and societal aspects (Bolcárová & Kološta, 2015; Ramos & Caeiro, 2010).

Guillen-Royo (2018) suggests that achieving The achievement of sustainable development necessitates the execution of development strategies that foster economic expansion, advance social equity, and mitigate detrimental environmental impacts. In the same way, Jin et al. (2020) provided a definition of sustainable development that underscores its multifaceted nature, prioritising the harmonisation of economic, social, and environmental dimensions of a given area while also ensuring equity for both current and future generations. There is a consensus among scholars that sustainable development comprises the economic, social, and environmental domains. In

order to optimise overall welfare for future generations while simultaneously promoting well-being in the present generation, sustainable development endeavours to harmonise economic, social, and environmental progress efforts.

Agenda 2063 is a comprehensive plan focusing on Africa's socio-economic transformation over the next five decades. Its primary objective is to accelerate the implementation of existing continental initiatives for sustainable growth and development. The goals of Agenda 2063 are in line with the Sustainable Development Goals (SDGs) and encompass achieving a high standard of living and well-being for all citizens, promoting education and skills development through science, technology, and innovation, improving citizens' health and nutrition, transforming economies, increasing agricultural productivity, promoting a thriving blue ocean economy, building environmentally sustainable and climate-resilient economies and communities, fostering a united Africa, establishing and operating continental financial and monetary institutions, developing world-class infrastructure across the continent, promoting democratic values and human rights, ensuring capable institutions and transformative leadership, preserving peace, security, and stability, establishing a functional African Peace and Security Architecture (APSA), prioritizing African cultural renaissance, empowering youth and children, positioning Africa as a major partner in global affairs, and promoting peaceful coexistence.

A key aspect of Agenda 2063 is that Africa takes responsibility for financing its own development goals. Notably, the Millennium Development Goals (MDGs) also played a significant role in Africa, focusing on eradicating

extreme poverty and hunger, providing universal primary education, promoting gender equality and women's empowerment, reducing child mortality, improving maternal health, combating diseases like AIDS and malaria, and fostering global partnerships for development.

For African countries, social inclusion is a crucial aspect of sustainable development. This involves integrating individuals, groups, or social categories (including people with disabilities) into the functioning of society as a whole. On the contrary, social exclusion and marginalisation refer to the opposite of inclusion. While African countries have historically faced challenges related to social exclusion, there is currently a stronger emphasis on the importance of fostering social inclusion to drive positive developmental changes.

Chapter Summary

This chapter summarises some preferential trade agreements in Africa, deep preferential trade agreement, looking at the environmental and labour provisions, and sustainable development, considering the history.

CHAPTER THREE

LITERATURE REVIEW

Introduction

This section presents a conceptual framework, theoretical review, with explicit emphasis on defining the theoretical premise that gives support for deep preferential trade agreements in international trade. In addition, some extant literature on the impacts of deep preferential trade agreements on sustainable development is explored, and the main and trending arguments about the empirical authenticity of deep PTAs effects are identified and discussed.

Conceptual Review

Labour provision in preferential trade agreement

The labour provisions found in preferential trade agreements (PTAs) differ in terms of their content and level of strictness, as well as their placement within the agreements. Some PTAs simply express the commitment of the participating countries to adhere to internationally recognised labour standards, either explicitly mentioning the International Labour Organisation (ILO) or not, often in the preambles. Others, however, go into more specifics, outlining the areas of concern and the ways in which the signatories will collaborate.

Some PTAs even establish procedures for addressing labour-related issues among their members through consultation. Among RTAs with detailed labour provisions, there are two common approaches for incorporating them. Some choose to include these provisions within the main text of the PTAs,

while others opt for separate side agreements or minutes of understanding (MOUs) dedicated to labour matters."

In a study by Kamata (2014), regional trade agreements (PTAs) were categorised into six groups based on the content and strictness of their labour provisions, as there is no universally accepted definition of "labour clauses" in PTAs. The classification mainly centres around whether the provisions make reference to the "core standards" of the International Labour Organisation or an equivalent set of "internationally recognised labour standards.

PTAs that include any provision related to these internationally recognised standards are labelled "PTAs with labour clauses," while those lacking such provisions are termed "PTAs without labour clauses. The categorization of RTAs with labour clauses is based on an assessment of the potential effectiveness of these clauses in enhancing domestic labour standards or conditions among member countries. This evaluation takes into account factors such as the level of coordination between members concerning labour standards and the mechanisms put in place for enforcing these provisions.

Raess and Sari (2018) introduced the Labour Provisions in Trade Agreements (LABPTA) dataset, which provides a comprehensive analysis of labour provisions in international trade agreements. The researchers drew attention that earlier research on labour clauses in trade had a narrow focus on particular agreements and had not systematically categorised these agreements across a spectrum of clauses, including civil, political, and social rights as well as other labour clauses. As a result, the authors propose a more thorough methodology by methodically analyzing labour clauses that are found in a variety of agreements. They state that these clauses can take the shape of

"commitments," "coupons," "cooperation," "reporting requirement," and "sanctions," and they then provide statistics on how common these clauses are in national, sectoral, and regional agreements.

In another study regarding labour provisions, Postnikov and Bastiaens (2014) used data from the Cingranelli, Richards, and Clay Human Rights Data Project and a dataset of 123 EU PTAs. Employing the probit and ordered probit, the study found that labour clauses in EU PTAs are not very helpful in enhancing working conditions in developing nations. The effectiveness of labour clauses in PTAs, according to the researchers, is undermined by the dependence on a voluntary discussion between the EU and partner nations rather than particular enforcement procedures. The researchers also make the case that other political and economic interests in the EU's interactions with developing nations may limit the EU's ability to emphasise labour standards in trade deals. In its negotiations with developing nations, the EU, for instance, may place a higher priority on trade and investment objectives than labour standards.

They urge the EU to adopt a more thorough strategy that integrates labour standards with other social and economic policies, such as enhanced aid and technical assistance. They also urge the inclusion of civil society organizations in the dialogue process as well as increased openness in the EU's negotiations with partner nations.

Similarly, Bolle (2016) employed a qualitative approach to offer an overview of labour enforcement issues in FTAs, based on a thorough survey of academic and policy literature. The effectiveness of different enforcement tools, such as dispute resolution and labour capacity development, in

advancing labour rights is also examined. Bolle (2016) found out that these measures have been ineffective in stopping labour breaches and that novel strategies are thus required. The researcher was of the view that the conclusion offers suggestions for enhancing labour enforcement in FTAs, including more stringent labour clauses, powerful enforcement mechanisms, and more stakeholder involvement. The researcher further argued for the necessity of strong labour provisions in FTAs as well as the major hurdles that must be overcome to ensure their successful implementation, particularly in developing countries. The researcher focuses on the principal enforcement methods, such as sanctions and fines, as well as the barriers posed by political and lobbying forces.

Environmental provision in preferential trade agreement

Researchers have studied the evolution of preferential trade agreements (PTAs) and their effects over the past two decades. (Dür et al., 2014; Horn et al., 2010; Kohl et al., 2016). Historically, PTAs were primarily concerned with eliminating tariffs and quotas at the frontier. Since the 1990s, however, PTAs have expanded to include cross-border measures such as investment, services, intellectual property, and regulatory cooperation. These more recent PTAs cover a broad range of issues and seek to have a significant impact on domestic policies. (Dür et al., 2014).

The prevalence of environmental provisions has increased alongside the prevalence of behind-the-border measures in PTAs. In the 2000s, the number of environmental provisions in PTAs increased significantly, with each new PTA in 2016 containing an average of 100 provisions (Morin et al., 2018). Particularly developed nations tend to include numerous environmental

provisions in their agreements. These provisions extend beyond trade commitments to address a variety of environmental issues, including hazardous waste, deforestation, salmon stock protection, and CO₂ emissions mitigation (Lechner, 2016; Milewicz et al., 2018; Morin et al., 2018).

Some of these provisions also seek to harmonise environmental policies, strengthen multilateral environmental agreements, and facilitate the transmission of green technology to developing nations. Three main reasons drive the incorporation of environmental provisions into PTAs. First, some contend that such provisions are strategically added in order to obtain the support of social groups that might otherwise oppose economic liberalisation (Gallagher, 2004; Hufbauer et al., 2000). Empirical research demonstrates that people in a variety of countries favour including environmental provisions in PTAs, which lends support to this idea (Bernauer & Nguyen, 2015; Esty, 2001). However, citizens of developing nations may perceive these provisions as protectionist (Bastiaens & Postnikov, 2017).

Moreover, democratic countries are more likely than autocratic nations to include environmental provisions in their PTAs (Morin et al., 2018). Countries utilise PTAs to advocate higher global environmental standards as a second reason. PTAs are thought to have stronger enforcement mechanisms than environmental treaties, making them more suitable for addressing environmental issues. Moreover, PTAs encompassing multiple issue areas offer opportunities for trade-offs across these domains, making them more effective tools for environmental diplomacy than traditional multilateral negotiations that are solely focused on environmental protection.

Another explanation is that countries utilise PTAs as a means to advance higher global environmental standards (Jinnah & Lindsay, 2016; Johnson, 2015). Unlike environmental treaties, trade agreements are seen to offer more robust enforcement mechanisms, making them better suited to address environmental concerns. Additionally, PTAs that cover various issue areas, ranging from trade and investment liberalization to intellectual property rights, labour rights, and environmental protection, create opportunities for trade-offs across these areas. As a result, they may be perceived as more effective instruments for environmental diplomacy compared to traditional multilateral negotiations that solely concentrate on environmental protection.

However, Adinolfi et al. (2018); Esty (2001) by attempting to bridge the gap between trade and the environment analyses the relationship between the two. They give a thorough examination of the role of trade in environmental deterioration, as well as the extent to which environmental policies might have trade consequences. The study drew on a variety of literature from several disciplines, including international commerce, environmental studies, and political economics, and offered a historical history of trade and environmental policies and views.

The author stated that environmental and trade policies were thought to be at odds and that there was a need to reconcile these two disciplines in order to foster sustainable development. The researchers investigated the trade-environment debate and discovered three major points of contention. The first is concerned with the possibility that environmental regulations may provide domestic producers an unfair edge, leading to trade protectionism. The potential for environmental restrictions to create barriers to international trade

and hence impede economic expansion is the second source of conflict. The fourth source of contention is connected to trade's distributional effects.

Esty (2001) presented a variety of policy solutions to bridge the trade-environment split in order to resolve these causes of conflict. These recommendations include the use of voluntary and market-based environmental protection instruments, the development of international environmental standards, increased transparency in international environmental governance, and the inclusion of all stakeholders in environmental policy-making. Adinolfi et al. (2018) also contended that trade and the environment were not mutually exclusive and that there was a need to harmonise these two domains in order to foster long-term development. The researchers examined the role of international law in addressing trade-related environmental challenges and found a number of major legal instruments pertinent to this field of law. Multilateral environmental agreements (MEAs), World Trade Organization (WTO) agreements, and regional trade agreements are examples of these mechanisms.

Meanwhile, Blümer et al. (2020) also investigated the reason for including environmental clauses in trade agreements. They however investigated whether countries include environmental measures to defend their domestic environmental policies ("defensive") or to seek their offensive environmental objectives abroad ("offensive" motive). They argued that environmental clauses in trade agreements reflect competing interests and values among various countries and entities. The researchers conducted an empirical analysis of 285 trade agreements' environmental provisions and discovered that the inclusion of environmental provisions was motivated by

both defensive and offensive motivations. Furthermore, the authors examined the level of environmental standards in trade agreements and discovered that offensive environmental provisions were less standard than defensive provisions. Blümer et al. (2020) discovered that nations with relatively strong environmental policies were more likely to include defensive environmental clauses in trade agreements than countries with relatively poor environmental policies. They claim that this implies that countries with lax environmental rules may be attempting to weaken environmental standards in other countries through trade agreements.

In contrast, Morin and Rochette (2017) investigated the convergence of environmental clauses in preferential trade agreements (PTAs) between the European Union (Goosen et al.) and the United States (US). The researchers evaluated the environmental provisions in four distinct PTAs between the EU and the US and examined the causes for the changes and also examined the legal and administrative foundations of the PTAs, drawing on a wide range of literature on international trade and the environment. According to the researchers, the PTAs were created to address growing concerns about the environmental effects of international trade and to promote sustainable development and discovered that the environmental requirements of the four PTAs they studied steadily converged over time.

Morin and Rochette (2017) pointed out that earlier PTAs, such as the Transatlantic Economic Council and the New Transatlantic Agenda, had only weak environmental provisions, whereas later agreements, such as the Transatlantic Trade and Investment Partnership (TTIP and the Comprehensive Economic and Trade Agreement (CETA), had more ambitious provisions.

They also argued the reasons behind the PTAs' increased environmental ambition and identified many elements that contributed to the convergence and concluded that the improvement of environmental governance systems in both the EU and the United States, rising public awareness and concern about environmental issues, and the usefulness of environmental provisions in trade treaties are useful in supporting environmental protection.

Sustainable Development

Numerous authors have pointed out that the concept of sustainable development originated in the early 1970s, with various works highlighting the necessity to impose limits on the Western development model (Mebratu, 1998; Mitlin, 1992). The mounting evidence of adverse environmental impacts resulting from the green revolution in agriculture (Carson, 1962), industrial pollution exemplified by incidents like Minamata disease (Harada, 1995) and the Seveso disaster (Bertazzi, 1991), and the lifestyle and urbanization trends in the West (Meadows et al., 1972), all exposed the risks associated with sustaining the prevailing notion of economic growth as the primary strategy for global development.

This sparked a debate that gave rise to the concept of eco-development, an approach aiming to reconcile social progress with the imperative of preserving ecosystems to maintain the planet's habitability (Naredo, 2004). While eco-development did not take center stage in international policy, it paved the way for a new concept that connected development with sustainability (Mebratu, 1998).

The term sustainable development gained widespread recognition through the report "Our Common Future," published by the World

Commission on Environment and Development in 1987. This report defined sustainable development as development that meets the current needs without jeopardizing the ability of future generations to meet their own needs (Brundtland, 1987). This definition was embraced by much of the global community as the new paradigm for development (Alvarado-Herrera et al., 2017).

However, soon after, several authors pointed out the flaws in this definition. Naredo (2004) attributed the success of the term to its ambiguity, Van den Bergh (1996) identified and analysed various theoretical perspectives on sustainable development, and Onisto (1999) warned about the lack of a precise definition that incorporates the physical laws of nature, such as the principles of thermodynamics.

According to Mitlin (1992), the connection between sustainable development and economic growth has been at the core of the debate over its contradictory meaning, with different authors holding opposing views. Some argue that economic growth, understood as continuous expansion, is incompatible with sustainability since it is not feasible to sustain infinite growth on a finite planet (Spaiser et al., 2017).

Others emphasise the importance of economic growth in obtaining the resources needed to achieve sustainability, a viewpoint aligned with Kutnetz's hypothesis that economic growth is essential to remedy environmental damage (Dinda, 2004), though this claim lacks conclusive evidence beyond correlations observed in some countries between reduced pollution and sustained economic growth (Stem et al., 1996). Additionally, some authors stress the distinction between sustainable growth and sustainable development,

referring to different conceptions of development (Daly, 2006, 2017; Gallopín, 2004).

Despite the diverse interpretations and contradictions surrounding the concept of sustainable development, there is agreement on certain implications of sustainability. The discussion on sustainable development has led to alternatives that surpass the old development paradigm. On one hand, there is a recognition of the complexity of real systems, encompassing social, political-institutional, economic, and ecological dimensions as interrelated components, avoiding narrow sectoral approaches Spangenberg (2002); Valentin and Spangenberg (2000). On the other hand, the pursuit of inter- and intragenerational equity has emphasised the need to consider broader spatial and temporal horizons (Gallopín, 2003).

Other authors have approached the concept of sustainable development from a more abstract level. Bossel (1999) identified three main categories of constraints that limit sustainable development: physical constraints (related to ecosystems, natural laws, and resources), human nature (encompassing people, society, culture, and technology), and temporal limits (involving the temporality of natural and human processes). He proposed finding a space that constrains the strategic and political paths leading to sustainable development.

Similarly, Schellnhuber (1999) introduced the concept of coevolution, representing the possible paths of interaction between social and natural variables, and identifying a space in which both can coevolve (ecological niche). This highlights the need for a holistic understanding of planet Earth and the complex processes taking place on it.

Theoretical Review

Pollution haven hypothesis, heterogeneous trade theory, and race to the bottom hypothesis, provided the theoretical foundation for this study. This was chosen because it is the theory with the most relevant foundational understanding of how trade and sustainable development are addressed.

Porters Hypothesis

According to Porter and Linde (1995), Porter hypothesis suggests that environmental regulations can actually stimulate innovation, resulting in increased competitiveness and economic development. According to this hypothesis, companies will develop healthier and more efficient technologies and practices in response to well-designed and effectively implemented environmental regulations. Instead of being regarded as a burden, the authors argued that environmental regulations can spur companies to invest in research and development, resulting in technological advancements. Not only do these new technologies help businesses comply with regulations, but they also give them a competitive edge in the market.

The Porter Hypothesis is adopted into the study because it elucidates the relationship between deep PTA and sustainable development. In essence, the provisions within the deep PTA that aim to impose restrictions on firms ostensibly drive these firms to adopt innovative technologies in their production processes. As firms embrace innovation in their production methods, they enhance their competitiveness and profitability. Profitable firms, in turn, contribute to sustainable development through their commitment to continuous corporate social responsibility initiatives, thereby promoting the overall welfare of societies

Some researchers have examined the effects of environmental regulation on economic development, and the conclusions have been hotly contested for a considerable amount of time. According to X. Li et al. (2021), it has three main points: environmental regulation promoting economic growth, environmental regulation impeding economic growth, and the nonlinear relationship. Environmental regulation promotes economic development (Porter, 1996). The author argued that environmental regulations can motivate businesses to innovate. Through the innovation compensation effect, it is possible to not only mitigate costs, but also increase market competitiveness and enterprise benefits, thereby fostering economic growth (Yang et al., 2012).

Nonetheless, some academics believe that environmental regulation inhibits economic development. Chintrakarn (2008) confirm that environmental regulation policy will increase production costs and decrease efficiency, causing a crowding-out effect. Chong et al. (2016) demonstrate that environmental regulation has significant negative effects on China's economic growth, and that environmental regulations may increase costs and have prospective impacts on economic growth.

Pollution Haven Hypothesis

According to the concept of the pollution haven hypothesis, nations with laxer environmental regulations and standards draw investment from nations with stricter regulations. In order to take advantage of cheaper production costs and avoid expensive environmental compliance requirements, this theory contends that multinational businesses want to establish their operations in nations with lenient environmental rules. The pollution haven

hypothesis (PHH) predicts that trade liberalisation in goods leads to the relocation of pollution-intensive production from high-income countries with more stringent environmental regulations to low-income countries with lax environmental regulations. Developing countries could therefore enjoy a comparative advantage in pollution-intensive products and become pollution havens.

The Pollution Haven hypothesis by (Copeland & Taylor, 2004), which links country income levels and the stringency of environmental regulation to predictions on pollution levels and liberal trade patterns, is one of the hotly debated predictions in international economics. The hypothesis proposes a two-country static general equilibrium model of international trade based on a continuum of items distinguished by pollution intensity.

The model only has one primary component of production, and it assumes that countries differ primarily in their endowment of human capital. The model is built to reflect three realities: first, global income distribution is extremely unequal; second, industries differ substantially in their pollution intensity of production; and third, environmental quality is a normal good. It then uses these assumptions to make predictions about trade patterns and pollution levels. The emergence of trade liberalisation as an environmental issue became a topic of interest as a result of initiatives such as the North American Free Trade Agreement and the Uruguay Round of GATT negotiations.

The Pollution Haven Hypothesis (PHH) has become one of international economics' most contentious and widely debated hypotheses since that time. It is at the heart of the trade and environment issue because it

establishes a clear link between disparities in environmental regulation and economic flows between countries. According to the hypothesis, liberalised trade in products will lead to the migration of pollution-intensive industries from high-income nations with strict environmental regulations to low-income countries with lax environmental regulations (Copeland & Taylor, 2004). The hypothesis supports the idea that strict environmental policies raise the cost of economic activity, incentivizing firms to relocate their manufacturing stages to nations with laxer environmental restrictions.

The inclusion of Pollution Haven Hypothesis in this study is pertinent because it posits that the presence of restrictive or stringent environmental clauses in DPTAs encourages firms to adhere to cleaner technologies. Compliance with cleaner technologies by these firms restricts the extent of environmental degradation, thereby fostering a sustainable environment capable of meeting the needs of the current population and ensuring the well-being of future generations.

Environmental quality is a normal good, according to proponents of free trade; hence, trade-induced wealth gains should lead to political demands for stricter environmental standards (Copeland & Taylor, 2004; Schleich, 1999). As a result of the higher criteria, cleaner production methods should emerge. Sceptics, on the other hand, argue that if manufacturing practices remain unchanged, pollution will continue to rise as trade expands.

If environmental quality is considered a normal good, developing countries will adopt lower environmental standards. As a result of income disparities around the world, free trade may have an impact on the composition of national output, with many developing countries shifting to

more polluting activities (Schleich, 1999). Earlier studies using aggregate trade did not find much evidence of a pollution haven effect. Nevertheless, new studies using more disaggregate data and accounting for endogeneity issues and spillovers tend to find some support for it (Broner et al., 2012; Martínez-Zarzoso & Oueslati, 2016; Millimet & Roy, 2016).

Race to Bottom Hypothesis

The concept of a race to the bottom states that when states or nations compete for capital or business, they may lower labour standards, environmental restrictions, or taxation in order to improve economic growth. In an effort to surpass one another, states may engage in a "race" in which they gradually lower their standards. As each state or nation competes to attract the most business, the phrase "race to the bottom" implies that, as a consequence, standards are gradually lowered.

The race to the bottom has been extensively studied with regard to globalisation and international trade. It has its roots in the subject of political economy. According to Stewart (1992), nations may strive to continually reduce their standards and restrictions in order to create a more welcoming business environment as they compete to attract investment. The race to the bottom theory proponent claimed that this phenomenon may have unfavourable outcomes. For instance, reducing labour standards may lead to increased worker exploitation, deteriorating working conditions, and lower salaries (Cao et al., 2017). In a similar vein, loosening environmental standards might impede development. However, detractors of the idea contend that there is not enough empirical data to back these assertions and that other

variables, such as technical breakthroughs and comparative advantages, may have a more substantial impact on the dynamics of the global economy.

In a globalised economy, countries, especially producers and officials from established nations worried about competition from emergent economies, frequently believe that exploiting low or lowered labour standards will increase their trade competitiveness. This perception contributes to public apprehension about "races to the bottom.". However, does having lower labour standards truly enhance a country's trade competitiveness? Theoretical literature, such as the works of Brown et al. (1993); Martin and Maskus (2001), suggests that this is not always the case. In fact, there are instances where countries can worsen their export performance or economic growth.

A number of empirical studies, including Co-operation and Development (1996); (Dehejia & Samy, 2004); Rodrik (1996) have argued that there is no relationship between labour clauses and the export performances of countries. Similar empirical studies, such as those by Obeng et al. (2023); Van Beers (1998) found a convincing relationship between deep preferential trade agreements and export performances for countries. They found that there was a negative relationship between them.

Brown et al. (1993) took into account resource-intensive labour requirements and argued that these standards would reduce the resources available for industrial output. They draw the conclusion that by enforcing harsher labour laws in the exporting sector, the relative cost of the industries impacted by these laws will rise, improving a nation's terms of trade. Furthermore, they discover that, in contrast to widely held notions, improving labour standards in sectors that depend significantly on labour will help

exporters of labour-intensive goods, particularly in developing nations, by improving their terms of trade. Furthermore, Martin and Maskus (2001); Maskus (1997) revealed that weak labour standards often distort the market and have detrimental consequences on a country's productivity, export performance, and overall economic well-being. These findings contradict the belief that weak labour standards do not significantly affect a country's economy.

Empirical Review

In the late 1990s and early 2000s, a nexus between deep PTAs and sustainable development started to take shape. During this time, governments, civil society organisations, and international organisations began to increasingly recognise the significance of labour rights, environmental clauses for sustainable development, and the potential role that trade policy may play in advancing these rights. The Declaration on Fundamental Principles and Rights at Work was adopted by the International Labour Organisation, and it recognised the significance of fundamental labour laws like the freedom of association, the right to collective bargaining, and the outlawing of child labour and forced.

This proclamation paved the way for the insertion of labour clauses in PTAs as nations tried to utilise trade policy to further their interests. Similarly, the 1992 United Nations Conference on Environment and Development (UNCED), commonly known as the Earth Summit, which led to the establishment of Agenda 21, a guide for sustainable development, was one of the significant turning points in this process. Agenda 21 emphasised the

importance of trade in fostering sustainable development and urged the incorporation of environmental clauses into trade policy.

Effect of deep preferential trade agreement on economic sustainability

The first empirical investigations into the relationship between labour standards and a country's export performance were conducted by Aggarwal (1995); (Co-operation & Development, 1996). Aggarwal analysed data from 10 developing countries, specifically looking at their exports to the United States and various labour standards, including core standards, employment conditions, and wages. Surprisingly, Aggarwal did not find any evidence supporting the commonly held belief. Similarly, Co-operation and Development (1996) focused on the impact of FACB rights on 44 countries and also found no evidence supporting the conventional wisdom.

In the study conducted by Mah (1997), data from 45 developing countries was analysed to investigate the impact of ratifying the core conventions of the International Labour Organisation on a country's export performance. Surprisingly, Mah (1997) discovered a consistent trend that aligned with conventional wisdom: countries that had ratified fewer core conventions tended to have higher exports. However, it is important to note that Mah (1997) and other researchers caution that the ratification of ILO core conventions might not accurately measure labour standards.

Studies on labour standards utilise different measures to capture various aspects of labour conditions. These measures include qualitative indexes (in the form of zero-one dummies or scale numbers) as well as quantitative variables, and some studies use both. In these studies, a labour standard measure is typically included in a regression to examine the impact of

each specific labour standard or condition separately. Dehejia and Samy (2004); Rodrik (1996) explore the influence of labour standards on a country's export per GDP using multiple labour condition measures for a wide range of countries. They also consider a country's labour and human-capital endowments as other potential factors determining comparative advantage. Their findings suggest that a country's export performance is well explained by its factor endowments but not by the level of its labour standards.

Similarly, Busse (2002) takes a similar approach but focuses on the effects of labour standards on a country's unskilled-labour-intensive manufacturing exports (as a share of total exports). He uses both quantitative and qualitative proxies for different labour standards, along with cross-country data for 83 countries. Interestingly, his findings reveal significant negative relationships between labour-intensive exports and proxies for child labour. However, unlike Mah (1997), Busse (2002) does not find any significant relationship between labour-intensive exports and the ratification of ILO core conventions.

Meanwhile, the influence of deep preferential trade agreements (PTAs) on export efficiency in Ghana while taking institutional quality into account has been examined by (Obeng et al., 2023). The authors rely on panel data from 44 African countries, with a particular emphasis on Ghana. They estimate export efficiency using stochastic frontier analysis. Despite the fact that export efficiency does not specifically focus on economic development, export efficiency, on the other hand, is a crucial factor in economic development, as countries with efficient export sectors tend to have higher levels of economic development. According to Obeng et al. (2023), deep

PTAs reduce Ghana's export efficiency. As a result, a deep preferential trade agreement reduces economic development in Ghana by lessening its exports. Furthermore, the analysis emphasises the significance of institutions in mediating the relationship between deep PTAs and export efficiency. In this regard, Ghanaian policymakers may need to focus on enhancing institutional quality in order for exporters to meet market regulations and continue to benefit from preferential trade agreements.

Some studies utilise a gravity-equation approach to examine the relationship between a country's labour standards and bilateral export flows. For instance, Van Beers (1998) uses a measure of labour standard stringency and includes the scores of both the exporting and importing countries in the gravity equation. However, his findings indicate no significant effects of labour standard stringency on either aggregate or labour-intensive exports between countries. It is important to note that his sample only includes 18 OECD countries and does not account for non-OECD developing countries.

Similar to the finding Obeng et al. (2023), Berger et al. (2020) also reported on the deep preferential trade agreement on some aspects of sustainable development, such as economic development. To analyse the trade effects of environmental agreements in PTAs, Berger et al. (2020) used a quantitative research approach for the study. To calculate the impact of environmental provisions on bilateral trade flows between PTA partners, the econometric study employed is a gravity model. The researchers suggested that imposing more agreements and standards on cooperating nations may reduce trade flows, which explicitly affect economic sustainability.

Similarly, Hanna (2010) evaluated the effects of the US Clean Air Act using a panel of firm-level data over the period of 1966-1999. The researcher discovered that more stringent US regulations led to the relocation of production outside the country. She is of the view that multinational corporations, when subject to regulation, were able to raise their foreign assets by 5.3 percent and their foreign output by 9 percent. However, companies operating under heavy regulation did not exhibit a disproportionately higher increase in foreign investment in developing nations. This implies that when the provisions are enforced and implemented, they will reduce exports. This finding is in line with (Berger et al., 2020; Obeng et al., 2023).

In line with Berger et al. (2020); De Santis (2012) also reported on the impact of environmental regulation on trade, specifically looking at comparative advantage. The study was quantitative research, where the researcher employed the Hausman and Taylor models and the gravity model by using data from 15 EU countries as exporting countries and 24 countries as trading partners from the period 1988-2008. They argued that there is a negative impact of environmental regulations on bilateral trading. This means that there is a reduction in the amount of goods exported, which will implicitly affect the economic growth of the countries trading.

However, Lechner (2018) also investigated the significance of non-trade concerns in PTAs involving the United States, including labour and environmental requirements, which emphasised the arguments of (Berger et al., 2020; Obeng et al., 2023). The researcher examined how the prevalence of non-trade concerns in PTAs influences bilateral investment flows between the US and its PTA partners using a gravity model. While Lechner acknowledges

that such matters are frequently covered in PTAs in an effort to advance development and address public concerns, she contends that doing so also produces winners and losers among domestic investors. However, the author pointed out that PTAs that strengthen these standards may have a negative impact on US investors in sectors like the textile industry that rely on lax labour and environmental norms.

On the other hand, PTAs that address these challenges may be advantageous to local investors in sectors that have already embraced high standards, like the chemical sector, as they level the playing field with international rivals who could have lower standards. The findings demonstrated that the effects varied across different sectors: environmental provisions in PTAs decreased foreign direct investment (FDI) in polluting industries but had a positive effect on environmentally clean industries.

On the contrary, Kox and Rojas-Romagosa (2019) also investigated the possible effects of deep preferential trade agreements on foreign direct investment (FDI) using gravity estimations based on bilateral data. While the study does not explicitly address economic growth, the study's findings indicated that deep PTAs can have a beneficial impact on FDI flows, which can have significant implications for economic growth in the nations that receive such investment. The authors discovered a favourable relationship between deep PTAs and FDI flows.

The study discovers that the influence of deep PTAs on FDI is greater for agreements that cover a broader variety of policy areas and include investment provisions. Furthermore, the study discovered that deep PTAs promote FDI from countries that are already investing in the host country. The

presence of foreign investment can also stimulate innovation and competitiveness by increasing competition in domestic markets (Kox & Rojas-Romagosa, 2019). As a result, the study's finding of a positive relationship between deep PTAs and FDI flows shows that these agreements could potentially help economic growth and, thus, economic sustainability in host nations by attracting foreign capital and boosting technological transfer and innovation.

Similar to the work by Kox and Rojas-Romagosa (2019), Fan et al. (2023), looked at "The Asymmetric Effects of Deep Preferential Trade Agreements on Bilateral GVC Participation Levels" using panel data from 43 countries from 2000-2014. The authors demonstrated that increasing the deep PTAs can enhance the level of participation in bilateral GVC by lowering trade barriers, policy uncertainty, and transaction costs. This positive effect differs between developed and developing member countries.

Specifically, the deepening of PTAs has a more substantial impact on the GVC participation level of developing member countries compared to that of developed member countries. And thus, the provisions of PTAs are more likely to cause an asymmetric effect on the GVC participation level between developing and developed members compared to the commodity provisions. Lowering trade barriers, policy uncertainty, and transaction costs will in turn lead to an improvement in economic growth, which will eventually promote economic dimension of sustainability.

A study by Lee and Kim (2022) also examined the impact of deep preferential trade agreements (PTAs) on global value chain (GVC) trade flows during the period between 1995 and 2015. They utilised an advanced gravity

model with three-dimensional fixed effects to analyse the data. The results of their research demonstrated that PTAs have a positive effect on GVC trade flows overall.

Additionally, they found that deep PTAs tend to be more effective in boosting GVC trade flows compared to shallow PTAs, a finding consistent with the conclusions of a study by (Fan et al., 2023). Moreover, the study indicated that the influence of deep integration on GVC trade flows varies depending on the income level and geographical origin of the countries involved in the bilateral agreements. The impact of different provisions in these agreements also contributes to the heterogeneous effects of deep PTAs, which are influenced by the specific characteristics of the signatory countries. This includes factors such as the number of legally enforceable WTO+ and WTO-X provisions in the agreements.

Similar to Berger et al. (2020); Kox and Rojas-Romagosa (2019); Obeng et al. (2023), Poletti et al. (2021) examined the role of EU trade agreements and global value chains (GVCs) in promoting sustainable development. The authors used a qualitative case study approach to determine the extent to which EU trade agreements with Vietnam relate to sustainable development, that is, economic growth. The researchers argued that while both trade and GVCs have the potential to promote sustainable development objectives, these agreements alone are insufficient to promote economic growth.

The researchers present a critical analysis of the literature on the connection between trade and sustainable development and draw attention to the shortcomings of the frameworks currently in use for quantifying how trade

agreements affect economic growth. Poletti et al. (2021) contended that in order to take into consideration the different ways in which trade may affect economic sustainability, a more thorough framework is required and that by emphasising the implementation of environmental and labour laws into trade, the EU has been a leader in promoting sustainability through its trade policy.

Moreover, Mattoo et al. (2022) also reported on the impact of deep preferential agreements on trade creation and trade diversion. A quantitative approach was used, in which gravity estimation was employed, and the data was sourced from the World Bank database from 2002-2004. The researchers emphasised that while shallow trade agreements lessen trade barriers, deep trade agreements go further by focusing on nontraditional trade barriers like domestic regulations, intellectual property rights, labour standards, and environmental concerns. By addressing issues behind the border, such provisions can create new trade opportunities. The increase in efficiency, production, and competition among member countries as a result of the creation of new trade opportunities will promote economic growth.

However, Tomassetti (2018) provided an insightful analysis of the relationship between labour provision and environmental sustainability. A doctrinal legal study was used to assess the extent to which labour law can be used to promote environmental sustainability. He reviewed labour laws and regulations in various countries and regions, as well as international labour standards and environmental agreements. According to the author, these components of labour legislation can play a significant role in fostering environmental sustainability.

For example, when workers have the freedom to negotiate collectively for better working conditions or greater compensation, they are also better positioned to demand a safe and environmentally friendly work environment. Similarly, when employees have the right to organise, they can band together to push for policies that promote environmental dimension of sustainability, such as green energy programmes or alternative modes of transportation. He further emphasises that labour laws can play a crucial role in addressing these challenges by promoting sustainable development. Another critical aspect of his work focuses on the role of labour laws in promoting environmental dimension of sustainability. These labour laws can play a crucial role in protecting worker health and wellbeing and the environment.

Furthermore, Bartels (2013) also examines the inclusion of human rights and sustainable development obligations in free trade agreements. It was primarily qualitative and involved a comprehensive review and analysis. The study also drew upon a range of literature on international trade and labour rights in EU free trade agreements. To attain sustainable development goals, the researcher contended that human rights and sustainable development requirements, including labour standards, must be included in any FTA.

The author also argued that promoting sustainable development and promoting labour rights were the two critical goals of EU free trade agreements and were thus interrelated. Furthermore, the researcher emphasises that the lack of binding force and proper enforcement mechanisms in present PTAs limits the effectiveness of labour standards in fostering sustainable development. The author again argued that progress towards sustainable development necessitates the inclusion of binding and enforceable labour

standards measures in FTAs, such as clear and explicit language in the agreements' clauses on labour standard implementation, monitoring, and enforcement, in order to ensure that economic growth is balanced with social and environmental considerations. This balance is becoming increasingly critical in view of mounting worries about climate change, natural resource depletion, and spreading global disparities.

Effect of a deep preferential trade agreement on environmental dimension of sustainability

The link between environmental clauses in trade agreements, notably those between the European Union and the United States (US), is examined by (Bastiaens & Postnikov, 2017). The scholars discussed the advantages and disadvantages of including environmental clauses in PTAs and looked at how they may help advance environmental dimension of sustainability. The main strength of the work is its emphasis on the contribution that environmental protections make to fostering environmental dimension of sustainability, which is a crucial component of contemporary international trade policy.

The researchers were of the view that environmental laws in PTAs can influence international trade patterns, promote environmental dimension of sustainability, and foster more collaboration in resolving environmental problems on a worldwide scale. They also addressed the question of how well PTAs work to advance sustainable development. According to the study, trade agreements' environmental clauses may help the included nations better implement and enforce their national environmental laws. However, they also pointed out that PTAs should be supplemented by more comprehensive policies that address environmental dimension of sustainability and that trade

agreements should not be relied upon as the only vehicle for initiatives in environmental dimension of sustainability.

The effect of environmental clauses in regional trade agreements (RTAs) on PM_{2.5} air pollution using panel data for 136 countries from 2001-2010 was studied by (Zhou et al., 2017). They also investigated the environmental clauses in RTAs that China has signed with other nations, with a specific focus on China. The China Environmental Statistics Yearbook, the World Bank's World Development Indicators, and the PM_{2.5} statistics from the US Environmental Protection Agency were just a few of the data sources used in the study. They conducted an analysis of the impact of environmental provisions in RTAs on air pollution levels using a difference-in-differences (DID) technique with propensity score matching. The authors analysed the levels of air pollution in two groups of Chinese cities: those closer to the borders of nations with which China has signed RTAs and those further away.

According to Zhou et al. (2017), air pollution levels may be effectively decreased by including environmental provisions. Air pollution levels are a serious concern for China's environment and public health. The authors stressed how the inclusion of environmental provisions in RTAs has the potential to promote environmental dimension of sustainability in China. This is a result of the reduction in PM_{2.5} air pollution. And this, in turn, improves the environment positively. The researchers also emphasised the significance of enforcing environmental laws, and it is suggested that doing so successfully is essential to accomplishing sustainable development goals.

Meanwhile, work by Nathaniel et al. (2021) also aligned with Zhou et al. (2017). Their study focused on investigating the interplay between

economic growth, energy consumption, international trade, ecological footprints, and environmental regulations in 11 emerging economies collectively referred to as N11. These economies include Bangladesh, Egypt, Indonesia, Iran, Mexico, Nigeria, Pakistan, the Philippines, Turkey, Vietnam, and South Korea. To examine the relationships between these variables, the authors employed the autoregressive distributed lag model (ARDL) to analyse both the long-term and short-term dynamics. The study utilised data collected from various sources, such as the World Bank, the International Energy Agency (IEA), and the Global Footprint Network, spanning the period from 1990 to 2017.

Through this comprehensive analysis, Nathaniel et al. explored how these different factors interacted and influenced each other in the context of the N11 economies. The study's findings suggest that the N11 nations' ecological footprints are positively impacted by economic development, energy consumption, and global commerce. The authors also discover that by lowering ecological footprints, environmental rules can significantly contribute to alleviating environmental degradation. The study also implies that the kind and extent of environmental restrictions may have an impact on how well environmental policies work to advance sustainability in these economies.

Similar to the above, Martínez-Zarzoso and Oueslati (2018) also studied the link between deep, comprehensive regional trade agreements and air pollution. The authors investigate whether deep, comprehensive regional trade agreements aid in air pollution reduction by supporting environmentally friendly policies and behaviors. The authors adopt a quantitative research

approach by using an instrumental variable strategy and employing a panel data approach to examine OECD nations from 1999 to 2011. The study found that regional trade agreements (RTAs) that include environmental provisions have a positive impact on reducing air pollution, as measured by PM_{2.5} emissions concentrations, and can help to align emissions levels among participating countries. The authors suggested that environmental provisions in RTAs can lead to more stringent environmental regulations and enforcement, which can in turn reduce environmental damage. This positive impact is not affected by a country's other national environmental policies or performance, as measured by the environmental performance index.

Additionally, the study shows that the specific content of the environmental provisions can also have an impact, as a higher level of environmental provisions is positively correlated with better environmental quality. However, Martínez-Zarzoso and Oueslati (2018) align themselves with the work of , which also looked at "Are RTA agreements with environmental provisions reducing emissions?" and came up with the same conclusion.

Similar to the works by Berger et al. (2020); Martínez-Zarzoso and Oueslati (2018); Zhou et al. (2017), Martínez-Zarzoso and Oueslati (2016) also reported that deep regional trade agreements help reduce air pollution. The authors employed a quantitative approach by looking at OECD countries over the period of 1990 to 2011. The authors also employed the GMM technique for the estimations. The authors also emphasised that there is a direct positive relationship between regional trade agreements and reducing air pollution. The reason for the direct effect of deep, comprehensive, and

regional trade agreements on reducing air pollution may be that the environmental provisions (EPs) included in these agreements encourage member countries to adopt and enforce more rigorous environmental regulations, which would ultimately lead to a decrease in environmental harm.

Effect of deep preferential trade agreement on social dimension of sustainability

The effect of a deep preferential trade agreement on social dimension of sustainability is being reported by (Liu et al., 2022). In the study, the author used a quantitative analysis by polling data from 2009 to 2017 covering 786,040 respondents in 143 countries, employing the fixed effect and stepwise regression. The author's argument is that regional trade agreements (RTAs) can have a significant and favourable effect on the health of individuals residing there. This implies that intensifying the level of RTAs can potentially enhance the health of their residents. Furthermore, deep RTAs can have an affirmative impact on residents' health due to their positive effects on employment opportunities and the environment, resulting in increased domestic employment.

However, a cross-country study by Huberman and Lewchuk (2003) used unique cross-country data from the pre-War period of 1853-1913, which was characterised as the "first wave of globalization." They developed the Labour Compact Index (LCI) by considering eleven indicators of labour regulations and conditions. They then analysed the relationship between the LCI and various economic variables, including the conventional trade openness index (the sum of exports and imports divided by GDP), the average tariff rate, and others. Their findings indicate that while the effect of tariff

rates was not significant, trade openness had a positive and significant impact on the LCI. This suggests that countries that were more integrated into the global economy tended to have better labour conditions.

In relation to the study by Liu et al. (2022), Liu et al. (2022) also reported on "Preferential Trade Agreements, Income Inequality, and Authoritarian Survival," which was also a quantitative study. The data was sourced from seventy-odd authoritarian regimes from 1960 to 2006. The researchers contended that preferential trade agreements reduce economic inequalities, therefore improving the wellbeing of poor labourers. These reductions in inequalities and improvements in the wellbeing of the labourers impact social dimension of sustainability positively.

Meanwhile, a study by Laget et al. (2021) also looked at the impact of a deep preferential trade agreement on foreign direct investment. The data was sourced from the World Bank database, and the study also employed the gravity model technique. The researchers suggested that deep preferential trade agreements increase foreign direct investment by 1.4 percent. This foreign direct investment is a service-related investment, thus improving social dimension of sustainability. The researchers also argued that deep PTAs negatively impact foreign direct investment in the extractive sectors.

The link between labour potential, notably in the Russian Arctic, and sustainable development was examined by (Korchak, 2019). He employs qualitative case study analysis based on document analysis and interviews with stakeholders participating in Russian Arctic sustainable development efforts. He highlighted the close relationship between labour provision and sustainable development. Korchak (2019) emphasises that human capital is a

critical factor in the sustainable development of any region. Therefore, in the case of the Russian Arctic, the development of a highly skilled workforce is crucial for the economic growth and long-term sustainability of the region.

He, however, looked at the challenges associated with the development of a skilled workforce in the region, including the difficulty of attracting and retaining skilled workers, as well as the need for the provision of education and training opportunities. He argues that these challenges need to be addressed through coordinated efforts by the government, the private sector, and local communities. The researcher concluded that integrating the local community into the economic development process and the involvement of the local population in economic activities can significantly improve human development, including the transfer of knowledge and skills, promoting cultural diversity, and generating employment opportunities.

The work by Harrison et al. (2019) also addresses the challenges and limitations of using free trade agreements (FTAs) to enhance labour standards and sustainable development. To highlight these issues and constraints, the researchers conducted a qualitative analysis of the European Union's trade and sustainable development chapters of FTAs. However, the piece also discusses the impact of labour standards on long-term development. While labour standards are an important component of sustainable development, they suggest that implementing labour standards in FTAs can be difficult.

The researchers, for example, point out that the lack of specific labour standard enforcement mechanisms in some FTAs can restrict their usefulness in improving labour practices and fostering sustainable development. Furthermore, Harrison et al. (2019) emphasise that the EU and its trade

partners frequently have unequal power relations, which might make it difficult to apply labour rules in practice. The researchers suggested that these power disparities can hinder labour unions and civil society organisations' ability to hold governments and corporations accountable for their labour policies, which, at the end of the day, will affect social dimension of sustainability negatively.

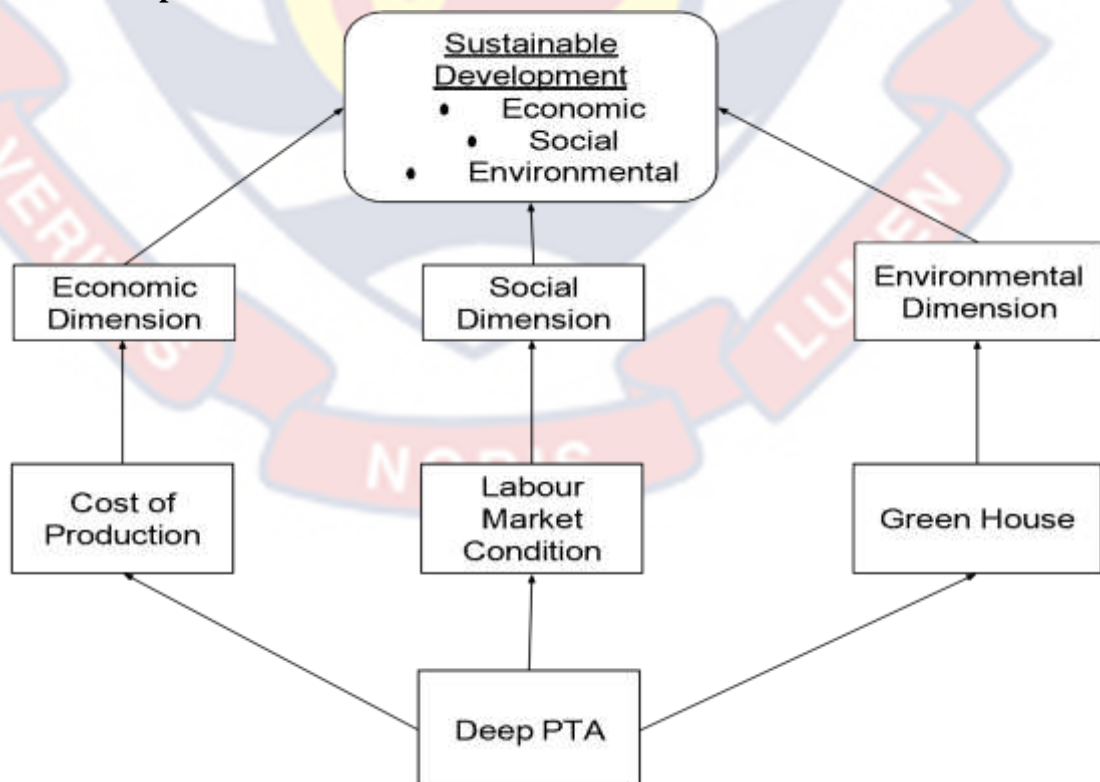
However, Kamata (2016) also investigates the relationship between labour clauses in regional trade agreements (RTAs) and their impact on labour conditions using benchmark empirical estimations. The study examined the effects of labour clauses on three metrics of working conditions: child labour, forced labour, and employment discrimination. The data used in the analysis comes from the World Bank and the International Labour Organization. The study also offers proof that binding RTAs with good monitoring systems contain labour clauses that are more effective. The significance of technical assistance programmes in assisting with the implementation of labour clauses is also highlighted in the report. Labour clauses can be a useful tool for advancing labour standards in underdeveloped nations.

However, RTAs with labour clauses improve labour conditions, particularly in the areas of child labour, forced labour, and working conditions. Workers' rights and working circumstances contribute significantly to social welfare, human growth, and improved working conditions that promote fair trade practices and ecologically friendly production (Kamata, 2016). Furthermore, the findings demonstrate that when an agreement includes robust enforcement mechanisms, such as the establishment of monitoring organisations or dispute resolution procedures, the influence of labour clauses

on working conditions increases. The study does, however, note the difficulties in enforcing such clauses as well as the possibility of unexpected outcomes, such as the transfer of labour to unofficial or illegal industries.

A work by Novitz (2018); Novitz and Mangan (2011) emphasises the need for establishing labour standards within international trade policy in order to defend workers' rights and maintain safe working conditions, thereby ensuring sustainable development and the welfare of individuals and communities. This contributes to the achievement of sustainable development goals by tackling social inequalities that are critical to encouraging inclusive economic growth that benefits society. They contend that increasing labour standards inside international trade agreements is feasible within the current legal frameworks and that strong enforcement measures to ensure that trade agreements' labour standards are adequately implemented will reduce social inequalities and increase employment.

Conceptual Framework



The study developed a conceptual framework that linked the deep preferential trade agreements and dimensions of sustainable development. The deep preferential trade agreement required that countries adhere to certain provisions. These provisions are in relation to the environment and labour issues. Deep preferential trade agreements can result in increased costs for businesses, such as investing in pollution control technologies or adhering to stricter environmental practices. These additional expenses add up to cost productions and therefore can impact GDP by reducing profitability and potentially limiting economic aspect of development in the countries. In the same vein, deep PTAs can help improve the improve air and water quality, reduce pollution, and mitigate climate change impacts. These therefore promote a healthier environment, leading to improved public health, reduced disease burden, and enhanced quality of life, all of which are important factors in the social development. Deep preferential trade agreements include provisions that require countries to reduce their greenhouse gas emissions or limit other air pollutants. These provisions can set specific targets for emission reduction and encourage the adoption of cleaner technologies and practices. By implementing these measures, countries can mitigate air pollution and improve air quality and therefore enhance environment development.

Furthermore, deep trade agreements can impact GDP by influencing labour market conditions and labour standards. These often promote fair and non-discriminatory treatment of workers, labour rights, and employment practices, such as minimum wage, working hours, and occupational safety. While these provisions can increase costs for businesses, such as higher wages or improved working conditions, they can also lead to a more productive and

efficient workforce. Improved labour provisions can attract and retain skilled workers, increase productivity, and reduce absenteeism and turnover, all of which can have a positive impact on economic development.

Deep PTAs, however, often aim to promote fair and non-discriminatory treatment of workers, protect their rights, and improve working conditions. By ensuring decent work and fair employment practices, these provisions can contribute to human development by enhancing workers' well-being, safety, and access to social protection. This, in turn, can positively affect social development. In the light of these links between deep PTAs and environment, social, and economic dimensions of sustainable development, the provisions are proxy as regulations.

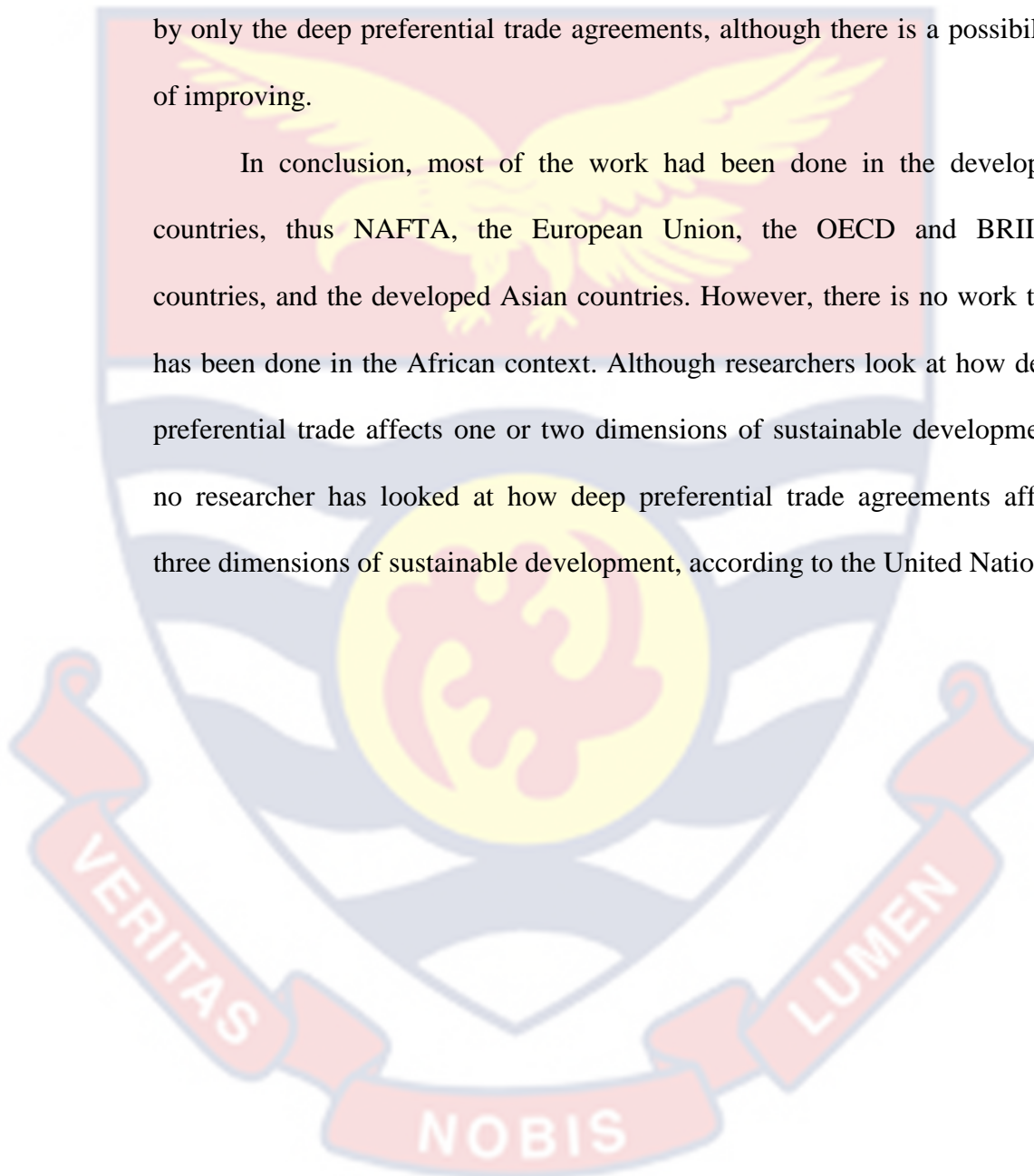
Chapter Summary

In this chapter, the main concept of the deep preferential trade agreement, including the environmental and labour provisions of the PTAs, and sustainable development are being reviewed. The study went on with theoretical underpinning of the study; and they are pollution haven hypothesis, porter hypothesis, and race to bottom hypothesis are discussed. The study also went on to reviewed the major empirical literature related to the work, taking into account the methodology and major findings, and also the study provides a conceptual framework for the study.

With respect to the methodology used, the quantitative approaches have been adopted by the researchers. In relation to the findings, some researchers argued that deep preferential trade agreements affect economic growth positively and negatively. Some also argued that a deep preferential trade agreement reduces environmental hazards and thus protects the

environment. In relation to the impact of deep preferential trade agreements on social dimension of sustainability, the majority of the researchers argued that deep preferential trade agreements improve social dimension of sustainability, while a few argued that social dimension of sustainability cannot be improved by only the deep preferential trade agreements, although there is a possibility of improving.

In conclusion, most of the work had been done in the developed countries, thus NAFTA, the European Union, the OECD and BRIICS countries, and the developed Asian countries. However, there is no work that has been done in the African context. Although researchers look at how deep preferential trade affects one or two dimensions of sustainable development, no researcher has looked at how deep preferential trade agreements affect three dimensions of sustainable development, according to the United Nations.



CHAPTER FOUR

RESEARCH METHODS

Introduction

The chapter explains the methodology adopted for the research and establishes a framework for analysis. The purpose is to give the study a proper methodological context for using the appropriate analysis tools. This chapter forms the basis for the subsequent chapters, which will present the results and recommendations. It covers aspects such as the research design, approach, and philosophy; the conceptual framework, and empirical models used; the data source and type; the justification and measurement of the variables; the estimation techniques employed.

Research Design, Approach, and Philosophy

One important aspect of conducting high-quality research is ensuring that your study objectives and questions align with your research design (Sinkovics et al., 2008). Saunders et al. (2007) proposed three types of research designs: explanatory, descriptive, and causal. In this study, we used an explanatory research design, which was chosen based on factors such as the problem's nature, its objectives, scope, and the data collected. Our decision to use an explanatory research design was motivated by the need to obtain background information and define the research problem's terms. Furthermore, it allowed us to develop a more profound comprehension of the research problem at hand.

This study utilised a quantitative research approach to examine how deep preferential trade agreements impact on Africa's sustainable development, in line with its goals and objectives. Quantitative research uses

statistical models to test and assess hypotheses about natural occurrences (Hohenthal, 2006). The quantitative research approach was chosen due to its effectiveness in promoting objectivity and generalizability, and its ability to reproduce the findings of the study.

Saunders et al. (2007) define research philosophy as the nature and development of knowledge, which underpins the research approach and methodologies employed during the study. Easterby-Smith et al. (2008) highlight the importance of grasping philosophical issues involving evidence required, data-gathering techniques, and analysis from the outset of the research process. In line with this, the study utilised a positivist approach. Malhotra (2017) notes that the positivist standpoint is founded on the idea that research should follow scientific principles used in the natural sciences. The study chose positivist research because it enables an objective perspective of reality that researchers aim to measure or explain, leading to simplified knowledge that is applicable across different individuals, time periods, and locations (Harrison & Reilly, 2011).

Empirical model specification

The study sought to examine the effect of deep preferential trade agreement on the three aspects of sustainable development in Africa. Three empirical models were analysed to research the comprehensive relationship between the deep preferential trade agreement and sustainable development which follows (Alotaibi & Alajlan, 2021).

$$\text{Objective 1: } \text{LogGS}_{ijt} = \alpha_0 + \alpha_1 \text{DPTA}_{jt} + \sum_{j=1}^r \gamma_j X_{itj} + z_{ijt}$$

$$\text{Objective 2: } \text{LogGDPpc}_{ijt} = \beta_0 + \beta_1 \text{DPTA}_{jt} + \sum_{j=1}^r \gamma_j X_{itj} + u_{ijt}$$

$$\text{Objective 3: } \text{HDI}_{ijt} = \phi_0 + \phi_1 \text{DPTA}_{jt} + \sum_{j=1}^r \gamma_j X_{itj} + v_{ijt}$$

Objective 4: $EI_{ijt} = \psi_0 + \psi_1 DPTA_{jt} + \sum_{j=1}^r \gamma_j X_{itj} + w_{ijt}$

where log is the logarithm, EI is environmental index, GDPpc is gross domestic product per capita, HDI as the human development index, GS is genuine saving index, and DPTA is the provisions in trade agreement for country i and country j, and $\{X_j\} \subseteq \{VA, RoL, GE, RQ, VA, UPoP \text{ and } PS\}$: RoL is rule of law, GE is Government Effectiveness, RQ is Regulatory Quality, VA is Voice and Accountability, PS is Political Stability, and URP is Urban Population are the control variables selected according to Equations. The parameters $\beta_0, \dots, \beta_2, \phi_0, \dots, \phi_2, \phi_0, \dots, \phi_2$ and ψ_0, \dots, ψ_2 are the elasticity estimates of the explanatory variables. This study uses a panel data from 1990 to 2021.

Quantile model (Bootstrapping)

Quantile regression (QR) is a statistical technique that is widely used in econometrics for modeling and estimating parameters. As an alternative to the classic mean model, Koenker and Bassett Jr (1978) created quantile regression (QR). QR, which provides a more detailed summary of the result distribution than the mean, is used to examine variable impacts through conditional quantiles of the dependent variable. It also provides advantages over traditional models in terms of resistance to outliers, non-normal, flexibility in that no precise parametric assumptions are required, and the capacity to investigate the full outcome distribution which gives a more reliable result. The study employed this model because of the non linear of the data and its segregation of the data distribution into suitable quantiles.

The former aims to estimate the conditional median and other quantile functions based on the work of Koenker and Bassett Jr (1978), while the latter

seeks to minimise asymmetrically weighted absolute residuals. For each subject in the sample ($i=1, \dots, n$), the outcome of interest is represented by q_i , where y_i represents an independent observation of a continuous random variable with a shared cumulative distribution function (CDF).

If we have a set of dependent and independent variables, denoted as y and x , respectively, and assume that there is a linear relationship between them, then the QR model estimates conditional quantiles of y given x .

$$y_q = x_{it}' \beta_q \dots \dots \dots 5$$

The coefficient of the q quantile, represented by β_q where q is within the range of 0 to 1, can be calculated by minimizing the objective function which is the total sum of the differences between the observed and predicted values.

$$\min_{\beta_q} \sum_{i \in \{y_{it} \geq x_{it}' \beta_q\}} q |y_{it} - x_{it}' \beta_q| + \sum_{i \in \{y_{it} < x_{it}' \beta_q\}} (1 - q) |y_{it} - x_{it}' \beta_q| \dots \dots \dots 6$$

The values of the coefficients in equation can be calculated using linear programming, and by gradually changing the quantile value from 0 to 1 (Buchinsky, 1995). According to Koenker and Bassett Jr (1978), the bootstrapped quantile regression method is more resilient to outliers and significant fluctuations in the data compared to the ordinary least squares method. Furthermore, according to Lin and Xu (2018), the OLS method can be unreliable when the dependent variable's distribution deviates significantly from the normal distribution, which is often the case in environmental and economic data. Conversely, the bootstrapped quantile regression method can detect heterogeneous relationships between the explanatory and dependent variables in such cases. Hence, the study employs bootstrapped quantile regression method which is robust for non stationary, non normal, and non-linear distribution.

Data source

The data utilized in this study was sourced from the World Development Indicators (WDI) and Trade and Investment databases (TREND), covering the period from 1990 to 2021. The study focused on a total of 23 African countries.

Measurement and Justification of Variables

In assessing the effects of deep preferential trade agreement on the economic, social, and environmental dimensions of sustainable development, the study made use of annual data over the period 1990 to 2021, using 23 countries in Africa. The variables include deep preferential trade agreement ($DPTA_{ijt}$) which is the key explanatory variables, gross domestic product per capita ($GDPpc_{ijt}$), the human development index (HDI_{ijt}), the genuine saving (GS_{ijt}) and the environmental index (EI_{ijt}) are dependent variables.

However, the voice and accountability (VA), the rule of law (RoL), the Government effectiveness (GE), the regulatory quality (RQ), the control of corruption, urban population (UPoP), and the political stability (PS) are the set of control variables.

Dependent Variables

The notion of sustainable development is complex and multifaceted, and progress toward a more sustainable future must be precisely measured using a variety of indicators. Numerous indicators that evaluate economic, social, and environmental dimensions can be used to measure sustainable development.

Gross Domestic Product per Capita

The gross domestic product per capita is the average market value of all goods and services produced of a country's population over a given period which is usually one year. The study uses GDP per capita (2015 constant prices), which is measured by dividing the gross domestic product by midyear population. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products divided by its population. It is calculated without making deductions for the depreciation of fabricated assets or depletion and degradation of natural resources. Data are in US dollars, of which the variables are in line with the studies by (Belloumi & Alshehry, 2020; Blattman et al., 2004; Kaimuri & Kosimbei, 2017).

Human Development Index

The Human Development indicator (HDI) is a composite indicator that gauges a nation's degree of human development based on three factors: standard of living, health, and education. It is a widely used measure for social development because it provides a more comprehensive picture of a country's development. Again, HDI is a better measure of both the standard of living and quality of life in a country because it uses a broad range of information and is not tied up with only one measure. A higher score on the HDI scale, which spans from 0 to 1, denotes a better degree of human development. A country's degree of human development is therefore anticipated to rise as its HDI value rises. A country with a higher HDI rating is likely to have longer life expectancies, greater levels of education, and higher per capita incomes that have been adjusted for purchasing power parity. The study uses this

variable because various researchers have employed it in their work (Cieřlik et al., 2012; Davies & Quinlivan, 2006; Hamid & Amin, 2013; Kaimuri & Kosimbei, 2017; D. Li et al., 2021).

Environmental Index

In the available literature, the understanding of environmental dimension of sustainability has remained relatively constant. Nevertheless, various research studies have utilised various sustainability indicators. In the present investigation, a variety of metrics are employed to evaluate environmental dimension of sustainability. To approximate environmental dimension of sustainability, the study considers indicators such as forest depletion, natural resource depletion, CO₂ emissions, and total greenhouse gases. Consequently, the study develops an index using the aforementioned sustainability variables (Ntow-Gyamfi et al., 2020).

Genuine Saving (GS)

Genuine saving (GS) is used for assessing an economy's sustainable development. The GS data used in this study is sourced from the World Development Indicators (WDI), released by the World Bank. It's important to highlight that, as emphasised by van der Ploeg (2011), there is a possibility that the World Bank's "adjusted net savings might overstate real savings, especially in countries abundant in natural resources. Nevertheless, the study have chosen to utilise WDI's ANS data as the primary source for our analysis, given its reputation as the most dependable and accessible data, as indicated by Sato et al., (2013). WDI furnishes GS data that is computed based on three categories of capital: the total of investments in manmade capital (net national savings), investments in human capital (education expenditures), and the

degradation of natural resources (including energy, minerals, forests, and CO₂ emissions).

Independent variables

The main independent variable of interest is the deep preferential trade agreements. However, the study has other control variables such as the regulatory quality, rule of law, voice and accountability, the government effectiveness, the Political Stability, urban population.

Deep PTAs

Deep preferential trade agreement refers to the degree and scope of the obligations and measures included in the agreement thus the environmental and labour provisions that go beyond tariff reduction or abolition. It assesses how far the agreement goes beyond simply lowering trade barriers to include other aspects of trade-related laws and regulations. PTA environmental provisions include member nations' promises to safeguard the environment, mitigate environmental impact from trade, and promote sustainable development while PTA labour provisions include member nations' promises to uphold and promote labour rights, as well as improve working conditions.

The study uses the “terms counting index” method to score the provisions. Deep PTA is employed as the main independent variable because of the expectations of the study. Deep PTA has the potential to contribute positively to sustainable development through the mitigation of environmental damage. Additionally, by integrating labour provisions that target societal welfare, deep PTA significantly contributes to the advancement of the social aspect of sustainable development. Furthermore, the economic dimension of sustainable development is poised to gain advantages from the deep PTA due

to its facilitation of trade barrier reduction. The data is sourced from Trade and Environment Database (TREND).

Voice and Accountability

"Voice" refers to the freedom of the people to speak their minds and have an impact on political decisions. It encompasses the freedoms of speech, the press, and the right to congregate and demonstrate in a peaceful manner. The term "accountability" describes how much the government is held accountable for its activities and is required to respond to the people. There must be procedures in place to hold public officials responsible for their conduct, as well as free and fair elections, an independent judiciary, and other factors.

In order for individuals to participate in decision-making processes and hold their government accountable for its actions, voice and accountability are crucial components of democratic governance. Additionally, it is crucial for encouraging transparency, lowering corruption, and making sure that programs and policies are responsive to citizens' needs and priorities. The rationale for including these variables is the expectation that voice and accountability will have a beneficial impact on sustainable development. This anticipation stems from the variable capability to attend to the present requirements and future ambitions of the populace. The constructive impact on sustainable development results from the conscientious evaluation and satisfaction of the desires and requirements of current and future generations.

Government Effectiveness

Government Effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence

from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies. Government effectiveness influences the quality and accessibility of public services. Sustainable development goals, including those related to education, healthcare, and infrastructure, depend on the government's ability to efficiently deliver these services to the population. In addition, effective governance ensures that resources are used judiciously, with an emphasis on sustainable practices that balance economic growth, social well-being, and environmental protection.

Political Stability

A country's assessments of the possibility of political instability and/or politically motivated violence, including terrorism. The Political Stability indicator is calculated based on assessments of the following factors, the number of political violence and terrorism incidents in the country, and the number of victims of political violence and terrorism in the country are all taken into account when calculating the political stability indicator. Political stability fosters policy continuity and predictability. In a politically stable environment, governments can formulate and implement long-term policies. This policies instills confidence in investors, both domestic and foreign. This confidence encourages investments in economic activities, which contribute to economic growth.

Control of Corruption

This variable measures perceptions of how much public authority is used for personal benefit, encompassing both small-scale and large-scale corruption. The frequency of additional payments to get things done in the

public sector, the capture of the government by elites and private interests, the misappropriation of public funds to businesses, people, or organizations as a result of corruption, the involvement of public officials in corruption, and the embezzlement of public funds are all assessed in order to determine the value of the control of corruption indicator.

Corruption often exacerbates social inequalities. It contributes to social equity by ensuring that public resources are distributed fairly and that all segments of society have equal access to opportunities and benefits. However, controlling corruption ensures that resources are allocated efficiently and used for their intended purposes. This is essential for sustainable development, as misallocation and diversion of resources can hinder the implementation of development projects and initiatives. A lower amount of corruption is indicated by a higher value, which is typically linked to better economic and social consequences.

Rule of Law

The study employed this variable because measures how much trust individuals have in and adherence to social norms, such as the effectiveness of contract enforcement, property rights, the police, and the legal system. The degree to which property rights are protected, the effectiveness and predictability of the judiciary, the impartiality of the judiciary, the quality of contract enforcement, and the protection of citizens' rights, including human rights, are assessed in order to determine the rule of law indicator. This variable is important because it establishes a stable and predictable legal environment, fostering an atmosphere conducive to sustainable development. Predictable legal systems enable individuals, businesses, and governments to

plan for the long term, encouraging investments in economic, social, and environmental initiatives that contribute to sustainability. In addition, clear and protected property rights, are crucial for economic development.

Regulatory Quality

This variable is included in the study because it measures public perceptions of the government's capacity to create and carry out sensible laws and regulations that support and encourage the growth of the private sector. The Regulatory Quality indicator is determined by evaluating the following variables: the cost of regulation to business, the standard of the regulatory framework, the effectiveness of the government bureaucracy in enforcing laws and regulations, and the degree to which companies can fairly compete in the market. The variable is important because in achieving a balance between the imperative for environmental protection and the pursuit of economic development, regulations assume a pivotal role. Regulations exert influence over businesses and industries by establishing benchmarks for emissions, waste management, and resource utilisation, thereby encouraging the adoption of more sustainable practices and mitigating adverse environmental effects.

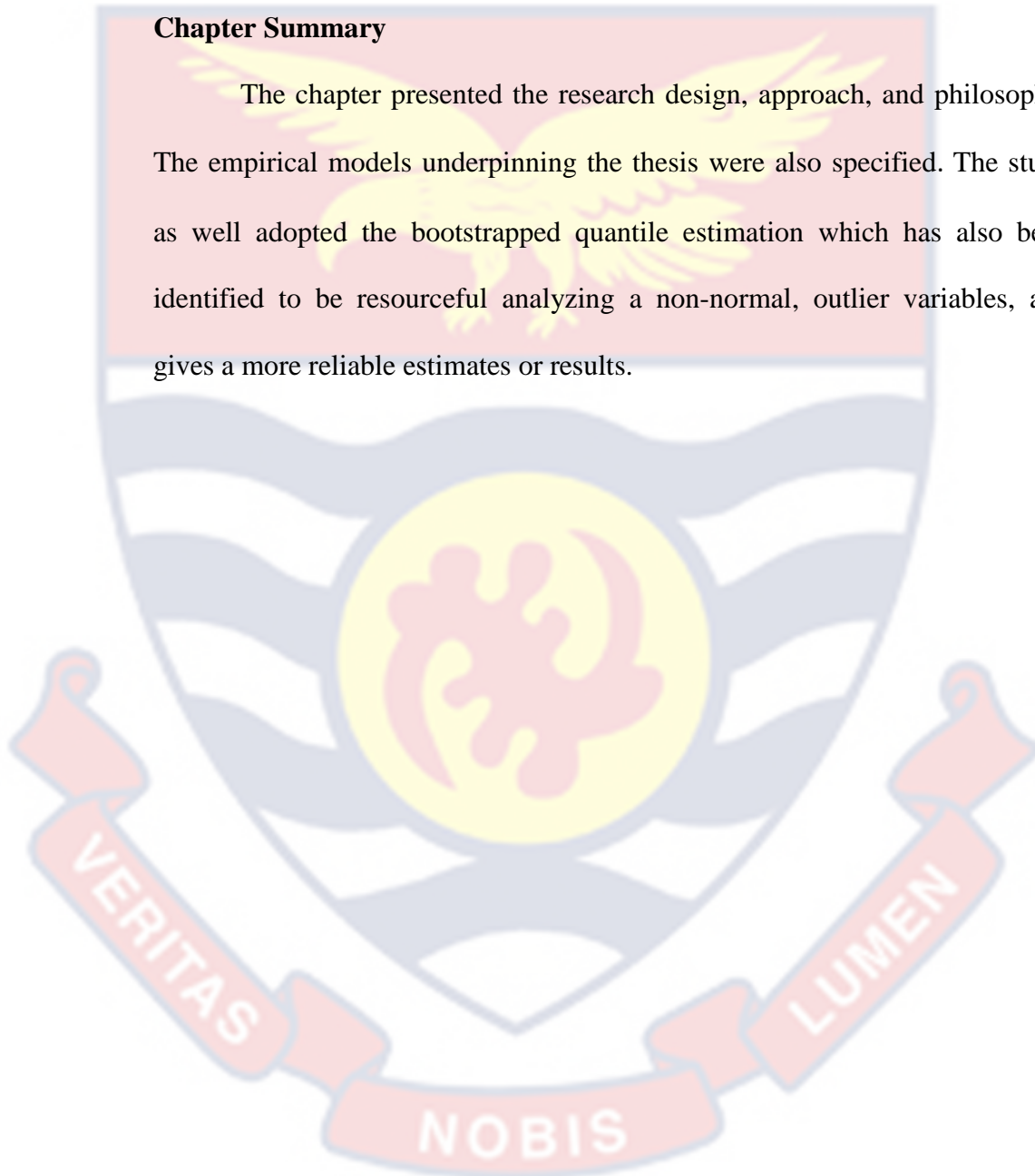
Urban population

The urban population refers to the overall count of people living in urban areas in a specific country, regardless of their legal status or citizenship. Refugees who haven't settled permanently in the country are not included. The research used the urban population of the chosen trading partner to make the estimate. The urban population is employed as a measure for determining the carbon emission per capita of the countries in this study. The variable is important in the study because urbanization can contribute to sustainable

growth through increased productivity and innovation if managed well. However, the speed and scale of urbanization brings challenges, such as meeting accelerated demand for affordable housing, viable infrastructure including transport systems, basic services, and jobs.

Chapter Summary

The chapter presented the research design, approach, and philosophy. The empirical models underpinning the thesis were also specified. The study as well adopted the bootstrapped quantile estimation which has also been identified to be resourceful analyzing a non-normal, outlier variables, and gives a more reliable estimates or results.



CHAPTER FIVE

RESULTS AND DISCUSSION

Introduction

This chapter presents the empirical results and discussions. The chapter is divided into three sections: the first section presents and discusses the results of the linear model pertaining to the effects of the deep PTAs on the economic dimension of sustainable development in Africa using the quantile estimation. The second section also presents the effects of deep PTAs on Africa's social dimension of sustainable development. Finally, the last section presents the effect of the deep PTAs on Africa's environmental dimension of sustainability. These estimations are in relation to the objectives and hypothesis of the study.

Descriptive Statistics

This section is the descriptive statistics of the study. This section of the study also discusses the basic statistical results of the variables in the study for the period under study (1990 to 2021). In the table below, you can see a range of descriptive statistics for eleven variables: DEEPPTA, LogGDP, HDI, Regulatory Quality, Rule of Law, Control of Corruption, Government Effectiveness, Voice and Accountability, Political Stability, Genuine saving, and EI. Obs relates to the number of data points or observations per variable. Mean refers to the average value of each variable. Std. Dev. calculates how far apart the values are from the average or mean value. Meanwhile Min and Max show the minimum and maximum values of each variable respectively.

Table 1: Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Deep Preferential Trade Agreement	736	9.412	8.154	0	18
LogGross Domestic Product per Capita	736	8.125	.283	7.741	8.601
Human Development Index	736	.544	.056	.46	.632
Regulatory Quality	736	-.624	.489	-2.202	.82
Rule of Law	736	-.679	.552	-1.87	.662
Control of Corruption	736	-.641	.517	-1.581	1.035
Government Effectiveness	736	-.707	.493	-1.791	.695
Voice and Accountability	736	-.568	.641	-1.851	.974
Political Stability	736	-.609	.816	-2.665	1.224
Urban Population	736	11400000	4050000	5629035	19038233
Environmental Index	736	1.66e-09	1.00003	-.44313	5.11272
LogGenuine Saving	736	22.0888	.5275854	21.21185	22.96751

Source: Author's calculation

From Table 1, the discussion of the summary statistic will cover the period under the study. The average deep PTA is 9.412, with minimum 0, and maximum 18. The average log GDPpc is US\$8.125million, with US\$7.741 and US\$8.601 as minimum and maximum respectively. The mean human development index is 0.544, with minimum 0.46, and maximum 0.632. The mean environmental index is 1.66e-09, with minimum -.44313 and maximum 5.11272. In addition, the mean urban population over the period is 11400000, with minimum being 5629035 and 19038233 as maximum. The regulatory

quality has its mean value as -0.624, with a minimum value of -2.202 and maximum being 0.82. Again, the average value of rule of law is -0.679, with minimum value being -1.87 and maximum being 0.662. The rate of the mean of corruption over the period of study is -0.641, with minimum -0.581 and maximum 1.035. The government effectiveness has a mean value of -0.707, with minimum -1.791 and maximum 0.695. Again, the mean value of voice and accountability is -0.568, with minimum value of -1.851 and maximum value of 0.974. The political stability has a mean value of -0.609, with minimum value of -2.665 and maximum value of 1.224 over the period of study. Again, the mean log genuine saving index is 22.08885, with minimum 21.21185, and maximum 22.96751.

Table 2: Normality Test

Variables	Obs	W	V	Z	Prob>z
Deep Preferential Trade Agreement	736	0.793	98.844	11.231	0.000
Urban population	736	0.952	22.895	7.655	0.000
Environmental index	736	0.4935	241.704	13.417	0.000
LogGross Domestic Product per capita	736	0.911	42.676	9.177	0.000
Human Development Index	736	0.937	30.098	8.324	0.000
Political stability	736	0.983	8.337	5.185	0.000
Government effectiveness	736	0.963	17.537	7.003	0.000
Control of corruption	736	0.952	23.012	7.667	0.000
Rule of law	736	0.976	11.373	5.944	0.000
Voice and accountability	736	0.973	12.727	6.219	0.000
Regulatory quality	736	0.991	4.442	3.646	0.000
LogGenuine saving	736	0.939	28.816	8.217	0.000

Source: Author's calculation

*** p<.01, ** p<.05, * p<.1

From Table 2, the study used shapiro-willk test to determines whether or not a given data sample is normally distributed. It determines if a sample is drawn from a regularly distributed population. The study adopted this test because of it sample size, that is the sample size must be less or equal to 50.

The test generates a test statistic that evaluates the sample's deviation from normality, as well as a p-value that reflects the likelihood of seeing such divergence under the null hypothesis. Several variables are checked for normalcy.

For each variable, the number of observations is shown in the "Obs" column. The test statistic, which ranges from 0 to 1, is displayed in the "W" column. The sample is more likely to be regularly distributed the closer the value is to 1. The crucial values for the test statistic are shown in the "V" column. The normalised test statistic is shown in the "z" column for comparison with a typical normal distribution. The p-value, which denotes the likelihood of obtaining such results under the supposition of normality, is shown in the "Prob>z" column. The results from the table indicate that the null hypothesis of normality is rejected for all variables because the p-values for all of the variables (Population, DEEPPTA, EI, LogGDP, HDI, Political Stability, Gov't Effectiveness, Corruption, Rule of Law, Voice and Accountability, Regulatory Quality) are extremely low (0.000). As a result, none of these variables' data is normally distributed.

Cross-Sectional Dependence**Table 3: CD-Test**

Variable	statistics	p-value
Deep Preferential Trade Agreement	18.399	0.000***
LogGross Domestic Product per capita	89.978	0.000***
Human Development Index	88.028	0.000***
Environmental Index	70.434	0.000***
Regulatory Quality	4.487	0.000***
Rule of Law	81.229	0.000***
Control of Corruption	0.762	0.446***
Government effectiveness	87.163	0.000***
Voice and Accountability	3.544	0.000***
Political Stability	82.822	0.000***
Urban Population	89.978	0.000***
LogGenuine Saving	89.978	0.000***

Source: Author's calculation *** p<.01, ** p<.05, * p<.1

The test for cross-sectional dependence is conducted in order for the variables in the study are independent, in order to find out the study is dealing with robust panel data. The table illustrates the test for cross-section dependence concerning each variable when assuming that cross-sections are independent. We find evidence to reject the assumption of cross-section independence for most variables, with the exception of corruption. This indicates that a majority of the variables used in the analysis within Africa exhibit interdependencies among cross-sectional units. This phenomenon of cross-section dependence likely stems from the increased interconnectedness

of economies among different sections of this region (De Hoyos & Sarafidis, 2006).

Table 4: Panel Unit Root

CIPS test

Variables	Level	Difference	Order
Deep preferential trade agreement	-1.223	-2.482***	I(1)
LogGross domestic product per capita	2.610***	2.610***	I(0)
Human development index	2.610***	-3.778***	I(0)
Environmental index	-1.614	-4.100***	I(1)
Regulatory quality	-1.833	-5.111***	I(1)
Rule of law	-1.166	-5.274***	I(1)
Control of corruption	-1.418	-5.125***	I(1)
Government effectiveness	1.605	-5.481***	I(1)
Voice and accountability	-1.994	-4.876***	I(1)
Political stability	-1.708	-5.059***	I(1)
Urban population	2.610***	2.610***	I(0)
LogGenuine saving	2.610***	2.610***	I(0)

Source: Author's calculation

*** p<.01, ** p<.05, * p<.1

It is crucial to examine whether the variables exhibit stationarity at either the initial level or after being differenced for the first time. Unlike the cross-sectional dependence, stationarity is conducted to determine whether the variables has a unit root or otherwise. The information presented in the Table 4 indicates that through the application of the CIPS unit root analysis approaches, it becomes evident that not all variables show stationarity in both

their initial form. However, when utilising the CIPS method (Pesaran, 2007), all variables demonstrate stationarity after the first difference.

Table 5 Cointegration

Modules	Estimators	Statistic	p value
Module1	ADF test	3.1605	0.0008***
	UMDF test	2.9481	0.0016***
Module2	ADF test	3.6759	0.0001***
	UMDF test	1.6798	0.0465**
Module3	ADF test	-0.2885	0.0579*
	UMDF test	-3.3171	0.0000***
Module4	ADF test	2.9290	0.0017***
	UMDF test	0.7390	0.2300**

Source: Author's calculation

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

Once the stationary nature of all variables in the difference has been confirmed in Table 4, it becomes imperative to assess the extended relationship between these variables. In this research, the Kao (1999) cointegration tests were employed to scrutinise the correlation among variables in their models. The null hypothesis in these tests assumes that there is no cointegration. As depicted in Table 5, the outcomes of the cointegration tests rejects the null hypothesis, affirming the existence of correlation between logGDPpc, HDI, EI, GS and their explanatory variables.

Table 6: Effect of Deep PTAs on sustainable development in Africa

Dependent variable: LogGenuine Saving

Independent variable	Lower (25 th)	Medium (50 th)	Upper(75 th)
Deep preferential trade agreement	0.0116*** (0.00373)	0.0211*** (0.00531)	0.00698* (0.00264)
Regulatory quality	-0.167* (0.0888)	-0.569*** (0.142)	-0.266*** (0.0864)
Government effectiveness	0.169* (0.0924)	0.207 (0.137)	0.0919 (0.102)
Rule of law	0.104 (0.0717)	0.416*** (0.131)	0.252** (0.104)
Political stability	-0.0835** (0.0420)	-0.188*** (0.0567)	-0.0987*** (0.0342)
Constant	-21.57*** (0.0403)	21.91*** (0.0722)	22.44*** (0.0281)
Observations	736	736	736

Source: Author's calculation Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

The estimated coefficients of the relationship between deep PTA sustainable development in Africa are presented in Table 6. Results indicate that the profundity of PTA has a statistically significant positive effect on sustainable development at the 1%, 5% and 10% levels for the lower, middle, and upper quantiles. This indicates that additional deep PTA will increase sustainable development by 1.16, 2.11, and 0.689 at the lower, middle, and upper quantiles respectively. This suggest that countries that engages in deep

preferential trade agreements enhanced sustainable development. The findings confirm the estimated results on the effect of deep PTA on the economic, social, and environmental dimensions of sustainable development.

Regulatory quality has a negative effect on sustainable development for all quantiles. The effect is statistically significant in the lower, middle and upper quantiles, but not in the lowest. This suggests that a higher standard of regulatory quality is associated with less sustainable development. The plausible rationale for the inverse relationship between regulatory quality and sustainable development lies in the observation that, within the African context, the effectiveness and efficiency of regulations frequently do not align with their intended outcomes. This discrepancy arises from the fact that, in practice, public administration encounters challenges in delivering on stringent regulatory structures or processes. Often, these regulatory frameworks are bypassed or sidestepped, impeding the desired impact on sustainable development.

Government effectiveness also has a positive and statistically significant effect on sustainable development at the lower quantile. At the middle and upper quantiles, however, the effect becomes statistically insignificant. This indicates that the positive impact of government effectiveness on sustainable development is greater in less developed economies. It is noteworthy to note that government effectiveness has a positive but non-statistically significant effect on sustainable development at the median and upper quantile. This may suggest that as countries attain average levels of development, the impact of government effectiveness on sustainable development begins to decrease. Again, rule of law has a positive

influence on sustainable development at the lower quantile, but the estimated coefficient is not statistically significant. In the middle and upper quantiles, rule of law has a statistically significant and positive effect on sustainable development. This suggests that higher levels of the rule of law are associated with higher levels of sustainable development, particularly in countries with moderate to high levels of development.

However, political stability has a negative effect on sustainable development at all quantiles, with statistically significant estimates at the lower and upper quantiles. This suggests that greater political stability is associated with less sustained development. A plausible explanation for the negative relationship between political stability and sustainable development is rooted in the dynamics of democracies, particularly in African contexts where a single party retains power for an extended duration. In such situations, government policies tend to be directed toward the advantage of specific segments of the population, consequently fostering social inequalities. The prolonged tenure of a single party in power may contribute to a concentration of benefits to a segment of the population, hindering the broader and more equitable distribution of resources and opportunities necessary for sustainable development.

Table 7 Effect of deep PTAs on economic dimension of sustainability**Dependent variable: LogGross Domestic Product per Capita**

Independent variables	Lower (25 th)	Middle (50 th)	Upper (75 th)
Deep preferential trade agreement	0.00637*** (0.00155)	0.00559* (0.00301)	0.00125 (0.00260)
Regulatory quality	-0.0564 (0.0376)	-0.235*** (0.0732)	-0.326*** (0.0630)
Rule of law	0.0152 (0.0387)	0.129* (0.0755)	0.269*** (0.0650)
Voice and accountability	0.00924 (0.0245)	0.143*** (0.0478)	0.196*** (0.0412)
Control of corruption	-0.00671 (0.0422)	0.0157 (0.0821)	-0.0182 (0.0708)
Political stability	-0.0270 (0.0167)	-0.165*** (0.0326)	-0.119*** (0.0281)
Government effectiveness	0.0909* (0.0483)	0.115 (0.0942)	-0.0530 (0.0811)
Constant	7.848*** (0.0205)	8.051*** (0.0400)	8.315*** (0.0345)
Observations	736	736	736

Source: Author's calculation Standard errors in parenthese *** p<0.01, ** p<0.05, * p<0.1

The Table 7 shows the estimated coefficients deep PTAs on economic dimension of development in Africa. The results show that the deep PTAs has a statistically significant positive effect on economic development at 1%

and 10% level across the lower and middle quantiles, with coefficients of 0.00637 and 0.00559 respectively. This means that a unit increase in deep PTA added will cause economic dimension of sustainability to increase by 0.00637 and 0.00559 at the lower and the middle quantile respectively, and also decrease economic development by 0.00125 at the upper quantile. This is consistent with the findings of (Kox & Rojas-Romagosa, 2019). This suggests that the effect of the deep PTAs on economic dimension of development is stronger for countries with lower and middle levels of development, but weakens or disappears as countries become more developed.

The negative effect, and the insignificant of deep PTAs on economic dimension of development at the 75th percentile may be as a result that higher-income African countries have more diverse economies and are less reliant on trade with other countries. As a result, the impact of PTAs on economic dimension of development may be less pronounced in certain countries.

Again, the economy size is may also be a reason for that. Smaller economies may benefit more from preferential trade deals because they have more room to expand and are more likely to increase productivity through foreign direct investment. The correlation between deep PTAs and economic aspect of development in the lower and middle quantiles is probably due to this. However, larger economies may already have diversified investment portfolios in the upper quantile and are reaching a point where adding greater deep PTAs does not significantly boost economic aspect of development.

The relationship between deep PTAs and economic development also contradict the race to bottom hypothesis, it confirms to the work of (Brown et

al., 1993; Martin & Maskus, 2001). From my perspective, this might be as result of policy issues where governments in the view of attracting investments into their country, will do whatever it takes to get investors in order to enhance development. Although, it has a positive effect on the economic development, it is not statistically significant at the upper quantile as the coefficient is only 0.00125.

With respect to regulatory quality, it has a negative significant effect on economic aspect of development the middle and upper quantiles. The coefficients indicate that this effect is stronger at higher levels of regulation, with a coefficient of -0.326 for the upper quantile compared to -0.235 at the lower and middle quantiles, respectively. The result also showed that better rule of law has a positive effect on economic aspect of development across all quantiles, but with a stronger effect at the middle and upper quantiles.

The coefficients indicate that a unit increase in rule of law leads to a higher improvement in economic aspect of development at the 50th and 75th percentiles, with coefficients of 0.129 and 0.269, respectively. From the results, it suggests that better voice and accountability has a positive effect on economic dimension of sustainability the middle and upper quantiles. The impact of Voice and Accountability on economic aspect development is stronger at the middle and upper quantiles with coefficients of 0.143 and 0.196, respectively. Control of corruption also has a negative effect on economic development at all quantiles, but its impact is not statistically significant. This implies that the effect of corruption on economic growth is uncertain and may depend on the level of development.

The coefficients suggest that political stability has a statistically significant negative effect on economic dimension of sustainability at the middle and upper quantiles with a coefficient of -0.1.65, -0.119 respectively. The results also show that government effectiveness has a positive and significant effect on economic development at the lower quantile, but the effect is not statistically significant at middle and upper quantiles.

Table 8: Effect of deep PTAs on social dimension of sustainability

Independent variable	Dependent variable: Human Development Index		
	Lower (25 th)	Middle (50 th)	Upper (75 th)
Deep preferential trade agreement	0.00154*** (0.000363)	0.00135** (0.000588)	0.000249 (0.000427)
Regulatory quality	-0.0129 (0.00881)	-0.0598*** (0.0143)	-0.0575*** (0.0104)
Rule of law	0.00460 (0.00909)	0.0339** (0.0147)	0.0491*** (0.0107)
Control of corruption	-0.00118 (0.00989)	0.000251 (0.0160)	-0.00115 (0.0116)
Political stability	-0.00701* (0.00392)	-0.0365*** (0.00635)	-0.0184*** (0.00461)
Government effectiveness	0.0213** (0.0113)	0.0277 (0.0184)	-0.00790 (0.0133)
Constant	0.485*** (0.00482)	0.533*** (0.00781)	0.586*** (0.00567)
Observations	736	736	736

Source: Author's calculation:

Standard errors in parentheses

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

The results from Table 8 show that there are significant differences in the effect of various factors on social dimensions of sustainable development across different quantiles of the distribution. Specifically, the deep PTAs have a positive and significant effect on social aspect of development in the lower and middle quantiles, with the coefficient estimates of 0.00154 and 0.00135, respectively. From the table, a unit increase in deep PTAs will enhance social aspects of development by 0.154, 0.135, and 0.0249, respectively. This result is in line with the findings of (Chang & Wu, 2016; Laget et al., 2021; Liu et al., 2022; Novitz, 2018).

However, the effect becomes smaller and insignificant in the upper quantile, with coefficient estimate dropping to 0.000249. This is as a result of access to resources and technology. In the lower and middle quantiles, countries with lower deep PTAs may have improved access to resources and technology through trade agreements. This can lead to greater investment in human capital, higher productivity, and advances in education, healthcare, and infrastructure all important components of the social development.

However, in the upper quantile, higher economies may already have access to resources and technology, leading to diminishing returns and an insignificant relationship between deep PTAs and social development. Again, policy effectiveness is also the reason for that. Good policies play a critical role in translating the benefits of PTAs into the enhancement of social aspects of development. In the lower and middle quantiles, countries with effective governance structures and policies are more likely to realise the potential benefits of PTAs for development.

In contrast, the regulatory quality variable has a negative and significant effect on social development in the middle and upper quantiles, with the coefficient estimates of -0.0598 and -0.0575, respectively. However, the effect is not significant in the lower quantile with coefficient -0.0129. Similarly, the rule of law variable has a positive and significant effect on social development in the middle and upper quantiles, with the coefficient estimates of 0.0339 and 0.0491, respectively. The effect is not significant in the lower quantile. The Voice and Accountability variable has a positive and significant effect on social development at the middle and upper quantiles, with the coefficient estimates of 0.0327, and 0.0282 respectively. Corruption variable has a small and insignificant effect on social aspects of development in all three quantiles.

Finally, the political stability has a negative and significant effects on social development in the lower, middle and upper quantiles. Again, government effectiveness has a significant and a positive relationship at the lower quantile. Overall, these results imply that the factors affecting social aspect of development vary across different levels of development, and policymakers should take into account these differences when designing policies to improve human development outcomes.

Table 9: Effect of deep PTAs on environmental dimension of sustainability in Africa

Independent variable	Dependent variable: Environmental Index		
	Lower (25 th)	Medium (50 th)	Upper(75 th)
Deep preferential trade agreement	-0.00249*** (0.000382)	-0.00868*** (0.00151)	-0.0469*** (0.00674)
Regulatory quality	0.0252** (0.0115)	0.0633*** (0.0180)	0.330 (0.219)
Government effectiveness	-0.0547*** (0.0120)	-0.0652*** (0.0109)	-0.282 (0.209)
Rule of law	0.0599*** (0.0184)	0.0847*** (0.0170)	0.283 (0.313)
Urban population	2.70e-09*** (7.93e-10)	3.81e-09*** (8.84e-10)	2.27e-09 (1.23e-08)
Constant	-0.391*** (0.0132)	-0.240*** (0.0332)	0.714*** (0.263)
Observations	736	736	736

Source: Author's calculation Standard errors in parenthesis *** p<0.01, **

p<0.05, * p<0.1

There is growing body of research that recognises the importance of the deep PTA in the environmental success of countries. The results presented in Table 9 showed that the estimated conditional quantiles are in line with trade theory and some of them are statistically significant with the expected sign at the different percentiles. That is the 25th, 50th, and 75th percentiles. The results show that there is a statistically significant negative relationship between the deep PTAs and the Africa's environmental aspect of sustainable development at the all the percentile, indicating that an additional unit increase of deep PTAs will improve environmental dimension of sustainable development by 0.0025, 0.0087, and 0.0469 respectively. This suggests that increasing deep PTAs is related with a direct improvement on the environment aspect of development. In this case deep PTAs is acting as barrier in order not to harm the environment. This finding is in line with Baghdadi et al., (2013),

Bastiaens & Postnikov, (2017), Martínez-Zarzoso & Oueslati, (2018) Nathaniel et al., (2021) Zhou et al., (2017).

The negative and significant level across all the quantile may as a result of the following factors such as, African nations have committed themselves to a number of international agreements, including the Paris Agreement and the Sustainable Development Goals (SDGs) of the United Nations. However, countries that are able to reduce their carbon emission get some bonuses from United Nation. By offering a framework for sustainable development and pushing laws that lessen climate change and lower carbon emissions per person, deeper PTAs can assist these commitments. Second, convergence of the provisions and policies is a common feature of PTAs. These agreements often call for the harmonisation of laws among signatory nations. These common laws and regulations may encourage African nations to take action to cut carbon emissions. More rigorous environmental restrictions may be adopted by African countries as a result of policy convergence within PTAs, which would reduce carbon emissions per person.

The additional control variables are regulatory quality, government effectiveness, rule of law and urban population. The coefficients for these variables are all significant in some quantiles, be it the lower, middle and the upper levels, indicating that they have an effect on environmental aspect of development. The results for the urban population agrees with the findings of (Alotaibi & Alajlan, 2021). Which implies that as the economy grows, the rate at which the environment is damage is very high. Government effectiveness also shows a negative and significant impact at the lower and middle quantiles with coefficients -0.0547 and -0.0652 respectively. There is

also a positive significant effect of regulatory quality on environmental dimension of sustainability at the lower and middle quantiles but insignificant at the upper quantile with coefficients 0.0252 and 0.0633 respectively.

Post Estimation Test

It is however important to check the robustness of the models in order to assess its validity (Kazemzadeh et al., 2022; Koengkan et al., 2019). Following the regression estimates, the Wald test proposed by Juodis et al. (2021) is employed to explore whether there is a causal relationship in the models.

H_0 : Selected covariates do not Granger-cause

H_0 : H_0 is violated

Table 10 : Granger Causality

Model	HPJ Wald Test	P value
Model1	195.8976	0.0000***
Model2	83.2648	0.0000***
Model3	109.524	0.0000***
Model4	280.6157	0.0000***

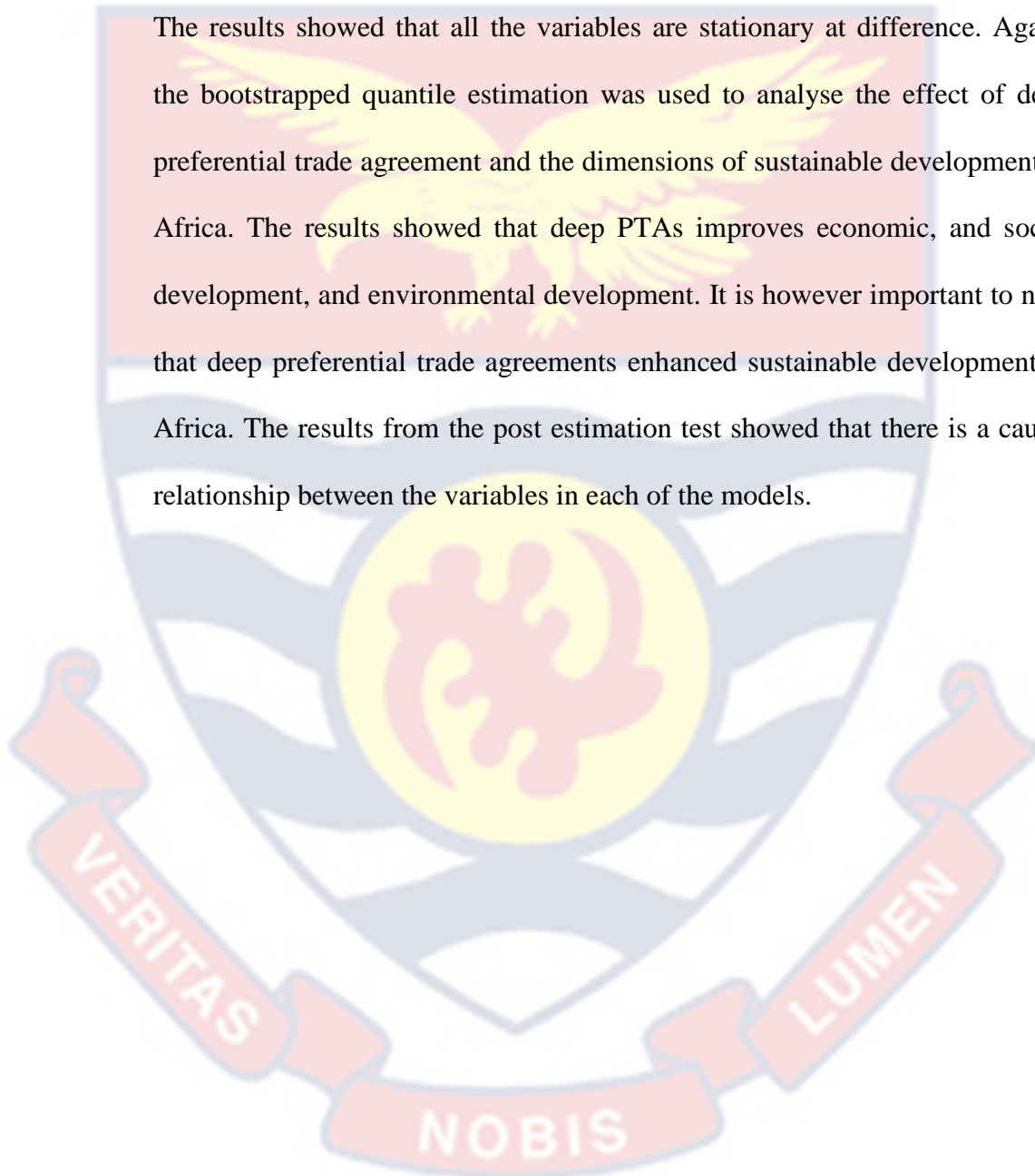
Source: Author's calculation *** $p < .01$, ** $p < .05$, * $p < .1$

Half-Panel Jackknife (HPJ)

From table 10, in all the models, we reject the null hypothesis and accept the alternate that there is a causal relationship between the variables in each of the models. From the models, all of them are significant at all the levels of significance with their respective test values of 195.8976, 83.2648, and 109.524 respectively.

Chapter Summary

In this chapter, the results from the normality test showed that none of the variables are normally distributed. The study further went on with the cross sectional dependence test, the panel unit root test, and cointegration test. The results showed that all the variables are stationary at difference. Again, the bootstrapped quantile estimation was used to analyse the effect of deep preferential trade agreement and the dimensions of sustainable development in Africa. The results showed that deep PTAs improves economic, and social development, and environmental development. It is however important to note that deep preferential trade agreements enhanced sustainable development in Africa. The results from the post estimation test showed that there is a causal relationship between the variables in each of the models.



CHAPTER SIX

SUMMARY, CONCLUSION, AND RECOMMENDATIONS

The following chapter outlines the summary, conclusions, and policy suggestions derived from the study's discoveries. Additionally, it offers recommendations for policy implementation and proposes potential avenues for future research.

Summary

Deep preferential trade agreements (PTAs) in Africa refer to trade agreements that go beyond basic tariff reductions and include a more comprehensive set of provisions designed to promote deeper economic integration among participating nations. Typically, these agreements encompass a wider range of issues, such as environment, labour, investments, intellectual property rights, competition policy, and more. Deep PTAs seek to improve the environment for trade and investment by addressing barriers other than tariffs.

The proliferation of deep preferential trade agreements has attracted the attention of researchers in recent times. Most of these studies solely focused on the effects of deep preferential trade agreements on trade in most developed countries. Although researchers looked at the effects of deep preferential trade agreement on sustainable development, they focused solely on one dimension of sustainable development which will not help achieve the true aspect of sustainable development. Therefore, this study investigated the effects of deep preferential trade agreements on sustainable development and the three dimensions of sustainable development (Brundtland, 1987; Guillen-Royo, 2018).

The study employed a quantile technique to estimate the effect of the deep preferential trade agreement on economic, social, and environmental dimensions of sustainable development using panel data from 1990-2021. The theories that the study employed are the porter hypothesis, pollution haven hypothesis, and race to bottom hypothesis.

Conclusions

The empirical evidence from objective one, which sought to investigate the effect of deep of preferential trade agreement on economic dimension of sustainability using quantile technique showed that the deep preferential trade agreement positively affects Africa's economic growth at the lower and middle quantiles. The results also showed that regulatory quality and political stability significantly reduced economic growth at the middle and the upper quantile while rule of law, government effectiveness, and voice and accountability significantly affects economic growth at the lower, middle and upper quantiles.

Objective two of the study investigate the effect of the deep preferential trade agreement on social dimension of sustainability. The results showed positive significant effects on social dimension of sustainability at the lower, and the middle quantile. The results also unveiled that there is a negative significant effect of regulatory quality, and political stability on social dimension of sustainability at the lower, middle, and upper quantile while there is also a positive significant effect of rule of law, voice and accountability, and government effectiveness on social dimension of sustainability at the lower, middle, and upper quantile.

The third objective investigates the effect of deep preferential trade agreement on environmental dimension of sustainability. The results showed that there is a significant negative effect on environment development at all the quantiles. The results further showed that urban population harm environmental dimension of sustainable development at the lower, and upper quantiles while government effectiveness negatively and significantly affect environmental dimension of sustainability at the lower, middle quantiles thereby improving the environment.

The fourth objective investigate the effect of deep preferential trade agreements on sustainable development. The results showed that there is a significant positive effect on sustainable development in all the quantiles. The results also showed some positive and negative significant in some of the other variables.

Recommendations

Preferential trade agreement plays a significant role in the development of every nation, particularly Africa countries. Based on the findings of the study, the following recommendations are suggested for policymakers. The findings of this study have important implications for policy.

Firstly, it is recommended that the governments and policy makers make a commitment to enhancing the effectiveness of their preferential trade agreements (PTAs) and encourage further development of these agreements to improve sustainable development. Countries should work towards expanding the scope of their PTAs, actively engage in negotiations with potential partners, and strengthening trade agreements that include measures for deeper

integration, such as lower trade barriers, infrastructure investment, and easier flow of products and services

Additionally, governments and policy makers should strengthen trade agreements in areas that goes beyond traditional preferential trade agreement such as tariffs and non-tariff barriers, but rather including environmental protection and labour standards. Existing PTAs should also be upgraded, with a focus on achieving a high level of liberalization in border policies and incorporating provisions for issues like environmental protection and labour supervision in order to promote sustainable practices, reduce pollution, and protect the environment. Furthermore, countries should have a holistic approach towards PTA development, adopting tailored strategies for different stages of development and prioritizing the establishment of deep PTAs by focusing on important border and behind-border areas.

Lastly, governments should focus on effective regulatory frameworks, transparency, minimizing corruption, and supporting political stability. Prioritizing rule of law, government effectiveness, and accountability promotes economic, social, and environmental sustainability. Again, it is critical to manage urbanization effectively and increase government effectiveness for environmental dimension of sustainability. This can be accomplished through urban design that prioritises sustainable development, investments in renewable energy sources, and the implementation of effective environmental policies.

Suggestions for Further Research

Future research could explore the impact of deep preferential trade agreements on sustainable development within regional blocs such as

ECOWAS, SADC, and COMESA. By conducting a similar analysis, it would be possible to gain insights into the specific effects of deep PTAs within these blocs and formulate targeted policy directions to promote sustainable development. This approach would help in designing policies that are tailored to the particular needs and dynamics of each regional bloc, ultimately maximizing the potential benefits for sustainable development within these areas.



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Appendix: Pairwise Correlations

Variables	Correlation											
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	
logGenuine saving	1.000											
logGross domestic product per capita	0.856	1.000										
Human development index	0.876	0.981	1.000									
Environmental index	0.070	0.080	0.087	1.000								
Regulatory quality	-0.069	-0.076	-0.083	0.381	1.000							
Rule of law	0.024	0.027	0.024	0.243	0.785	1.000						
Control of corruption	0.018	0.027	0.022	0.250	0.734	0.819	1.000					
Government effectiveness	-0.013	-0.022	-0.027	0.458	0.787	0.789	0.817	1.000				
Voice and accountability	0.084	0.110	0.108	0.214	0.587	0.680	0.685	0.537	1.000			
Political stability	-0.083	-0.121	-0.112	-0.041	0.541	0.634	0.610	0.524	0.576	1.000		
Urban population	0.879	0.991	0.979	0.076	-0.079	0.031	0.032	-0.017	0.110	-0.115	1.000	