



Non-Traditional Exports (NTE), Imports and Economic Growth in Ghana

A Dissertation

Presented to

The Development Finance Centre (DEFIC)
Graduate School of Business
University of Cape Town

In partial fulfilment
of the requirements for the degree of
Master of Commerce in Development Finance

by

Percy, Antwi-Agyei

(ANTPER002)

December 2022

Supervisor: Assoc. Prof. Abdul Latif Alhassan

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

TABLE OF CONTENTS

DECLARATION.....	iv
DEDICATION.....	v
ACKNOWLEDGEMENT.....	vi
ABSTRACT.....	vii
LIST OF FIGURES.....	viii
LIST OF TABLES.....	ix
LIST OF ACRONYMS & ABBREVIATIONS.....	x
CHAPTER 1.....	1
INTRODUCTION.....	1
1.1 Introduction and background of the study.....	1
1.2 Research problem and question.....	2
1.3 Research objectives and hypotheses.....	3
1.3.1 Research objectives.....	3
1.3.2 Research hypotheses.....	4
1.4 Justification and scope of the study.....	4
1.5 Organization of the study.....	5
CHAPTER 2.....	6
LITERATURE REVIEW.....	6
2.1 Introduction.....	6
2.2 Definition of terms and concepts.....	6
2.2.1 Non-Traditional Exports (NTE).....	6
2.2.2 Imports.....	6
2.2.3 Economic Growth.....	6
2.2.4 Overview of Non-Traditional Exports in Ghana.....	7
2.2.5 Overview of merchandise imports in Ghana.....	10
2.3 Theoretical Framework.....	13
2.3.1 Economic Growth Theories.....	13
2.3.2 Traditional Neo-Classical Growth Theory.....	13
2.3.3 Endogenous Growth/New Growth Theory.....	14
2.3.4 Export-Led Growth (ELG) Theory.....	14
2.3.5 Import-Led Growth Theory.....	15
2.4 Empirical Literature.....	16
2.5 Summary of the chapter.....	19
CHAPTER 3.....	23
METHODOLOGY.....	23
3.1 Introduction.....	23
3.2 Research approach.....	23
3.3 Research design.....	23
3.3.1 Data sources and period.....	23
3.3.2 Empirical model.....	24
3.3.3 Definition and measurement of variables.....	26
3.4 Estimation approach.....	29
3.4.1 Unit Root Test.....	29
3.4.2 Heteroscedasticity Test.....	30
3.4.3 Cointegration Test (Autoregressive Distributive Lag)	30
3.4.4 Vector Error Correction Model (VECM).....	32
3.5 Summary of the chapter.....	32

..

CHAPTER 4.....	33
RESEARCH FINDINGS, ANALYSIS & DISCUSSION.....	33
4.1 Introduction.....	33
4.2 Descriptive statistics.....	33
4.3 Unit Root Test.....	33
4.4 Correlation Analysis.....	36
4.5 Cointegration analysis: ARDL Approach.....	37
4.6 ARDL bound test.....	38
4.7 Long-run coefficients.....	38
4.8 Short-run coefficients.....	41
4.9 Diagnostic test.....	44
4.9.1 LM Test.....	44
4.9.2 Breusch-Pagan-Godfrey Test.....	44
4.9.3 Normality Test.....	45
4.10 Summary of the chapter.....	46
 CHAPTER 5.....	 48
CONCLUSION & RECOMMENDATION.....	48
5.1 Introduction.....	48
5.2 Summary and Conclusions.....	48
5.3 Policy recommendations.....	49
5.4 Avenue for future research.....	49
 REFERENCES.....	 51
APPENDICES.....	57
Appendix 1: Data set for analysis.....	57

DECLARATION

Plagiarism Declaration

I, Percy Asante Antwi-Agyei, hereby declare that the work on which this thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university. I authorise the University to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signature:

Signed by candidate

Date:

DEDICATION

I dedicate this dissertation to my mother, Victoria Akua Owusua Okae-Anti, for all her support, guidance, and encouragement throughout my academic journey. God bless you! I also dedicate this work to my wife Lily for the never-ending support, patience, and encouragement as I undertook this challenging but worthwhile work.

ACKNOWLEDGEMENT

I wish to thank God immensely for the grace and strength received to be able to go through this entire process successfully.

Special thanks go to Prof. Abdul Latif Alhassan for his great support and guidance throughout the dissertation process for this program. I am incredibly grateful for this.

To my children, Barima Kwame, Papa Yaw and Awura Adwoa, thank you for being so supportive and understanding with the lack of time I had for you because of this work. I also wish to thank my course mates for the knowledge and experiences we shared during this program and especially my study group mates Esther Antonio, Amanda Khoza, Joshua Ojo and Anne Wangalachi. You are just superb! Thank you all for the love, care, encouragement, and the support throughout the coursework.

ABSTRACT

Non-traditional exports and imports in Ghana have grown in recent years thereby taking up a significant portion of the nation's international trade. This study investigates the relationship that non-traditional exports and imports have with Ghana's economic growth, using the Gross Domestic Product growth as the proxy for economic growth. The research used annual time series data from 1986 to 2020 and a quantitative research methodology. The empirical investigation was based on estimation techniques including unit root and the Autoregressive Distributed Lag (ARDL) regression estimation cointegration technique, together with diagnostic tests to assess the appropriateness of the model.

The bounds test results showed the presence of cointegration between GDP growth and the NTEs as well as imports of Ghana within the period. The findings from the study showed that in the long run non-traditional exports have a positive insignificant relationship with the Gross Domestic Product growth. However, a positive significant relationship exists between NTE and economic growth in the short run. Imports have a positive and statistically significant relationship with economic growth in both the long run and the short run. Import trade impacted positively on the growth of the economy during the period under study. Gross Capital Formation also has a negative insignificant relationship with economic growth in both the short and long run. Inflation, however, showed an insignificant positive relationship with growth both in the long run and short run.

The study therefore recommends that deliberate policy interventions and guidance aimed at improving the existing non-traditional export basket should be looked at and, in addition, explore avenues to increase the commodities in the non-traditional export basket to enhance economic growth.

LIST OF FIGURES

Figure 1: Total value of NTEs (USD million, 2006 – 2015).....	7
Figure 2: NTEs compared to Total National Exports (USD million, 2016 – 2020)	8
Figure 3: Comparative analysis of top ten NTE products.....	10
Figure 4: Average annual composition of Ghana’s imports (1995-2014).....	11
Figure 5: Merchandise trade contribution to GDP.....	12
Figure 6: Normality test for model 1.....	46
Figure 7: Normality test for model 2.....	46

LIST OF TABLES

Table 1: Summary of product list.....	12
Table 2: Summary of Empirical Literature reviewed.....	21
Table 3: Description and sources of variables	29
Table 4: Descriptive statistics.....	33
Table 5: Unit root test results.....	35
Table 6: Summary of stationarity of variables.....	36
Table 7: Correlation analysis.....	37
Table 8: ARDL bound test.....	38
Table 9: ARDL long-run coefficients.....	39
Table 10: ARDL short-run coefficients.....	43
Table 11: LM serial correlation test.....	45

LIST OF ACRONYMS & ABBREVIATIONS

ARDL	Autoregressive Distributive Lag
BoG	Bank of Ghana
BoP	Balance of Payments
ELG	Export-led Growth
ERP	Economic Recovery Program
FAO	Food and Agriculture Organization
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
GEPA	Ghana Export Promotion Authority
GSS	Ghana Statistical Service
ILG	Import-Led Growth
LDCs	Less Developed Countries
NTE	Non-Traditional Exports
OLS	Ordinary Least Squares
UAE	United Arab Emirates
USD	United States Dollars
URT	Unit Root Test
VECM	Vector Error Correction Model
WDI	World Development Indicators
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION

1.1 Introduction and background of the study

International trade which is the exchange of goods and services across borders has been key in the economic development of most countries, especially developing countries. Export and import have been seen to have a significant impact on economic growth (Bakari, 2017a). Export and import are among the easiest international trade activities that one can undertake (Okyere & Jilu, 2020). They help both producers and sellers to access markets, products and services that may not be available domestically. Exports create employment for the people in the source countries as well as raise incomes and foreign exchange thereby creating an opportunity for countries to go beyond their local markets and to access the global markets for their goods and services (Obeng, 2021). This improves production capacity and enables transfer of technology to the source countries and increases economic growth. Imports, on the other hand, enable countries to access goods and services that may not be available locally.

Too much of imports are seen as an indication of a country's weakness in productive activities as it affects the local currency, weakens the balance of trade, and lowers economic growth (Habanabakize, 2020). Most developing countries such as Ghana have adopted an import substitution strategy to replace most imports with locally produced products. However, in certain instances imports may lead to economic growth especially if it involves the import of equipment, machinery, hardware, or technology that could facilitate local productive activities (Bakari & Mabrouki, 2017). Due to these reasons, the impact of exports and imports on the economic growth of a country in general has become contentious.

Ghana is the second largest economy, by Gross Domestic Product (GDP), after Nigeria in the Economic Community of West African States (ECOWAS) bloc. The economy depends largely on primary commodities – unprocessed minerals, cocoa beans, timber logs and electricity, also called traditional or primary export products. After independence, there was an import substitution strategy to reduce imports through increased tariffs, increased local manufacturing and a fixed exchange rate regime (Apalatoya, 2018). In 1995, a 25-year development plan (1995-2020) called Vision 2020 was launched with the focus on making Ghana a middle-income country by 2020 with the goal of increased export revenue of \$16 Billion (Buatsi, 2002).

This revenue target, it was noted, could not be achieved with the traditional products, so there was the need to expand the export base through diversification and introduce non-traditional export (NTE) products (Buatsi, 2002). Thus, export diversification came because of the failure of the traditional exports responding positively to price fluctuations and external shocks. This necessitated the Economic Recovery Program (ERP) in 1983 which had been, as part of its focus, boosting the domestic market through export promotion to counter the negative growth and put the economy on a stable path (Fosu, 2001).

The Ghana Export Promotion Authority (GEPA, 2016) was formed in 1969 to promote Ghana's export activities by enhancing both the products exported and the export destinations. According to the GEPA, NTEs includes all other export products that are not part of the traditional export products (GEPA, 2019). In 2019, the NTE sector contributed 18% of the total exports and earned \$2.899 billion, an increase of 3.10% over earnings from 2018 which stood at \$2.813 billion (GEPA, 2019). Between 2015 and 2019, the NTE sector has grown at an average rate of 2.97% (GEPA, 2019).

1.2 Research problem and question

Several studies have investigated the relationship between exports in general and imports on economic growth with varied results and findings (Bakari, 2017a; Bakari & Krit, 2017; Bakari & Mabrouki, 2017; Fannoun & Hassouneh, 2019; Guntukula, 2018; Okyere & Jilu, 2020). Generally, the expectation has been that exports lead to higher economic growth whilst imports is seen as a sign of low domestic productivity and hence does not increase growth. Economies that rely on export enhancement strategies do better in the medium and long term than those that use import substitution strategies (Medina-Smith, 2001).

In the case of Ghana, several studies on the country's export and economic performance however gave mixed results. Chanthunya (1991), analysing the relationship between export and growth in several ECOWAS countries including Ghana, concluded that there is a weak positive relationship between export and GDP. Okyere & Jilu (2020) investigated the impact of export and import on the economic growth of Ghana and found a positive causal relationship between exports and Ghana's GDP. Another study showed that a 1% increase in export will lead to a 20.8% increase in Ghana's economic growth (Boakye & Gyamfi, 2017). Again, it was found that international trade led to faster economic growth and reduction in poverty according to a

study by Yennu and team (Yennu, 2018). However, when it comes to the NTE sub sector, no study has been done on the impact of the NTEs specifically on the economic growth of Ghana. This is of immense importance because of the objectives considered for the development and improvement of the NTE sub sector in Ghana.

The NTE sub sector within the export regime was introduced and progressively enhanced to provide extra support and revenue streams for the economy to achieve the export revenue target of \$16 billion set as part of Vision 2020. The traditional export products over the years had shown that, by themselves, Ghana could not generate the needed export revenue (Buatsi, 2002). The performance of this sub sector in achieving this feat and enhancing the growth of the economy, therefore, is extremely critical. The absence of an independent study in understanding this impact will not elicit the needed and timely interventions from policy makers. This study aims to assess the relationship of the NTEs with the overall economic performance and growth of the country over the years thereby seeking to close this unknown gap.

In this study, the Export-Led Growth (ELG) hypothesis which postulates that an expansion in export is a key growth factor will be tested. Even though there is still some debate around the validity of the ELG hypothesis, Medina-smith (2001) argues that the ELG may be valid for a few developing countries and only to a certain extent. The ELG will be tested for the NTE sub sector of Ghana's exports.

1.3 Statement of research objectives and hypotheses

This section summarizes the objectives of this study and presents the research hypotheses.

1.3.1 Research objectives

The study intends to investigate the relationship between NTEs and imports and the growth of the Ghanaian economy. The impact of the NTEs sub-sector on Ghana's GDP has not been researched as far as I am aware. Therefore, the specific and fundamental objectives of this study is to

- i. Examine the relationship between NTEs and the economic growth of Ghana.
- ii. Assess how imports relates to the growth of the Ghanaian economy.

The study uses Gross Capital Formation (GCF) and inflation (INF) as control variables to see how these variables will relate to the economic growth of Ghana with the variables of interest in the model.

The analysis is based on the total annual NTE revenue, which is a consolidation of all the NTE product categories. The period of study is from 1986 to 2020. This period was chosen primarily due to the availability of NTE data and to include the entire duration of the Vision 2020 development plan which lasted from 1995 to 2020. Export diversification and development was a key objective of this plan and even though NTEs was increasing, it was still less than 10% of the total merchandise export in 1996 (Presidential Report, 2000).

1.3.2 Research hypotheses

To be able to answer the research questions raised out of the proposed research objectives, the following hypothesis have been formulated:

- a) Hypothesis 1: NTE has a positive and statistically significant relationship with the economic growth of Ghana.
- b) Hypothesis 2: Imports negatively and significantly affect the economic growth of Ghana.

1.4 Justification and scope of the study

Economic growth comes with an improvement in the lives of the people of any nation. Therefore, countries introduced policies, measures and actions that will enhance growth. The impact of exports and imports on economic growth from research has been mixed. There have been instances of both positive and negative relationships between exports and economic growth. The aim of the Ghana government since 1983 has been to reduce over reliance on the traditional exports and diversify the export trade to cover NTEs as a way of improving the economy (Fosu, 2001).

The study contributes to the existing literature that analyses the relationship of exports with economic growth in Ghana and, more importantly, it is one of the very few that specifically explores the relationship of the NTEs with the economic growth of Ghana. This study will help examine the effects that NTEs specifically and imports have had on the growth of the economy, assess how interventions so far in the export diversification space has impacted the economy and guide policy implementation regarding how NTEs should be managed going forward. It

will also help stakeholders to see if the trade-led growth theme is working well for the Ghanaian economy. The study relied on secondary data on economic growth and international trade for analysis. The findings, therefore, give some form of an empirical basis to the managers of the economy and offer help with export promotion activities.

1.5 Organization of the study

The study is organized into five chapters. An introduction of the background and the context within which the study is being done is captured in chapter one. This is necessary to give a background to the research work and this is followed by a review of the relevant and recent theoretical and empirical literature about exports, imports and their relationship and association with economic growth. Chapter three discusses the methodology used in the study taking into consideration the research approach and design that was employed in the study. The findings observed and insights noticed from the study are discussed in chapter four and conclusions, policy implications, and recommendations are captured and communicated in chapter five.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This section covers the review of the relevant literature and studies that have been done in the past with the objective of understanding what was done, the applicable theoretical frameworks and the limitations encountered, if any, and how that can guide this work. The section starts with a definition of the key concepts of Non-Traditional Exports (NTEs), imports and economic growth and looks at an overview of the NTE sector in Ghana. It then proceeds to analyse the key theoretical frameworks that guide the relationship between international trade, both exports and imports, and economic growth. The last part of the chapter looks at some empirical literature on the impact of foreign trade on economic growth from different countries.

2.2 Definition of terms and concepts

2.2.1 Non-Traditional Exports (NTEs)

NTEs are the class of export products from Ghana that are not historically traditional. The traditional or primary export products includes unprocessed minerals such as gold, cocoa beans, electricity, and timber logs. All other export products are classified as secondary or NTEs (GEPA, 2019).

2.2.2 Imports

Imports refers to the portion of foreign or international trade that involves one country buying goods and services from another country. This may involve both products and services. Imports play a key role in improving the economic growth of nations and it can provide local firms access to foreign technology and knowledge (Fannoun & Hassouneh, 2019).

2.2.3 Economic Growth

Economic growth refers to an increase in the ability of a nation to produce goods and services when compared from one period to the other. It can be measured either in nominal terms or real time i.e., when it is adjusted for inflation (Amadeo, 2021).

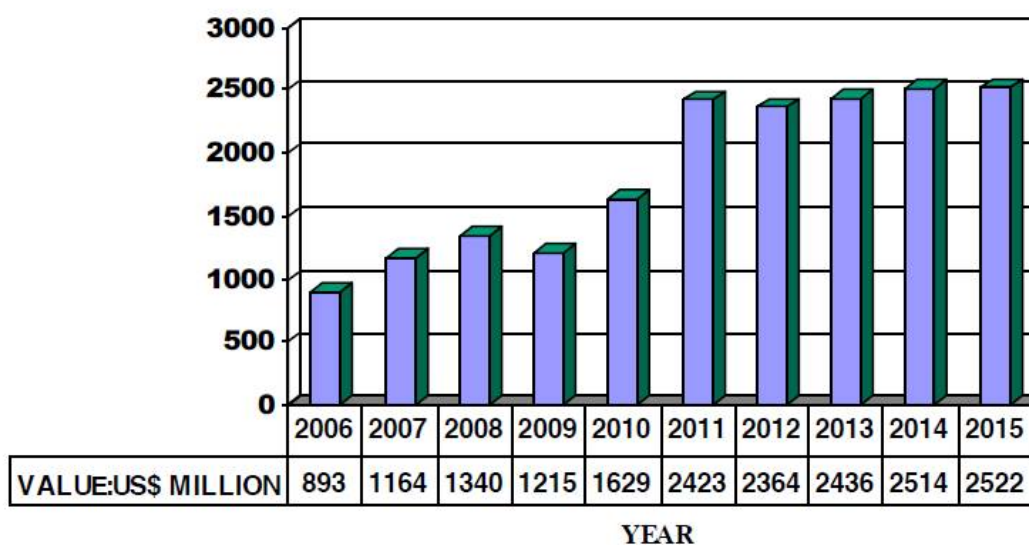
Economic growth shows an increase in the production of goods and services in a specific economy which is normally compared from one period to the other. It is mostly measured by increases in the market value of additional goods and services produced, and GDP growth is a

good estimate for this measure (Potters, 2021). GDP growth refers to the annual percentage growth rate of GDP at market prices based on constant local currency. The aggregates are based on constant 2015 prices, expressed in U.S. dollars. 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. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

2.2.4 Overview of Non-Traditional Exports in Ghana

Export and import are activities that are of importance to the economy of every nation. In 2020, the total value of imports for Ghana was \$12,509.56 million whilst total exports stood at \$14,641.397 million (Bank of Ghana, 2021). Whilst imports allow access to goods and services that are not available domestically for productive activities, exports create employment, enables access to foreign exchange, leads to favourable trade balance and economic development (Okyerere & Jilu, 2020). Figure 1 shows the total annual value of NTEs between 2006 and 2015.

Figure 1: Total value of NTEs (USD million, 2006 – 2015)



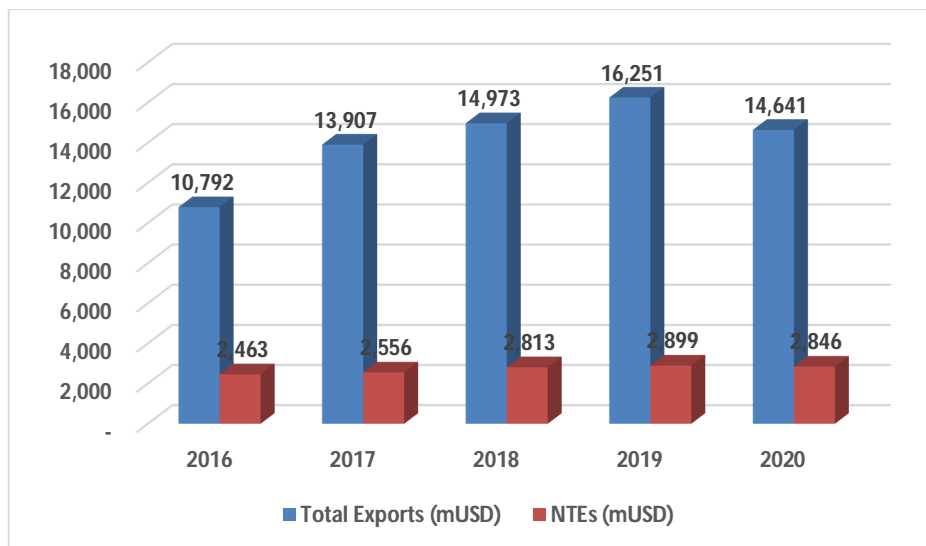
Source: Annual NTE Report, (GEPA 2015)

Export commodities in Ghana can be classified into the traditional and non-traditional exports. The primary products: cocoa beans, unprocessed minerals, timber logs and electricity constitute the traditional exports (GEPA, 2019). Every other export product is a non-traditional export (NTE). Over the years various intervention programs have been implemented by different

governments with the aim to enhance the performance of the NTE sub-sector, yet its real impact on the economic growth is yet to be ascertained. It is within this context that this study is carried out to assess the relationship that exists between the NTEs and the overall economic growth of the country using GDP growth as a proxy to the economic growth.

Ghana’s international trade has gone up over the years with increases in both exports and imports. According to the bank of Ghana (2021), total merchandise exports increased from \$2,687.09 million in 2005 to \$14,641.39 million in 2020, an increase of about 445%. Comparable increases can be seen for merchandise imports as well, increasing from \$5,279.81 million in 2005 to \$12,509.56 million in 2020. This represents an increase of approximately 137%. The increase in exports includes both traditional export commodities and the NTEs. Figure 2 shows the contribution of the NTEs to the total merchandise export of Ghana from 2016 to 2020.

Figure 2: NTEs compared to Total National Exports (USD million, 2016 – 2020)



Source: Annual NTE Reports, (GEPA 2020)

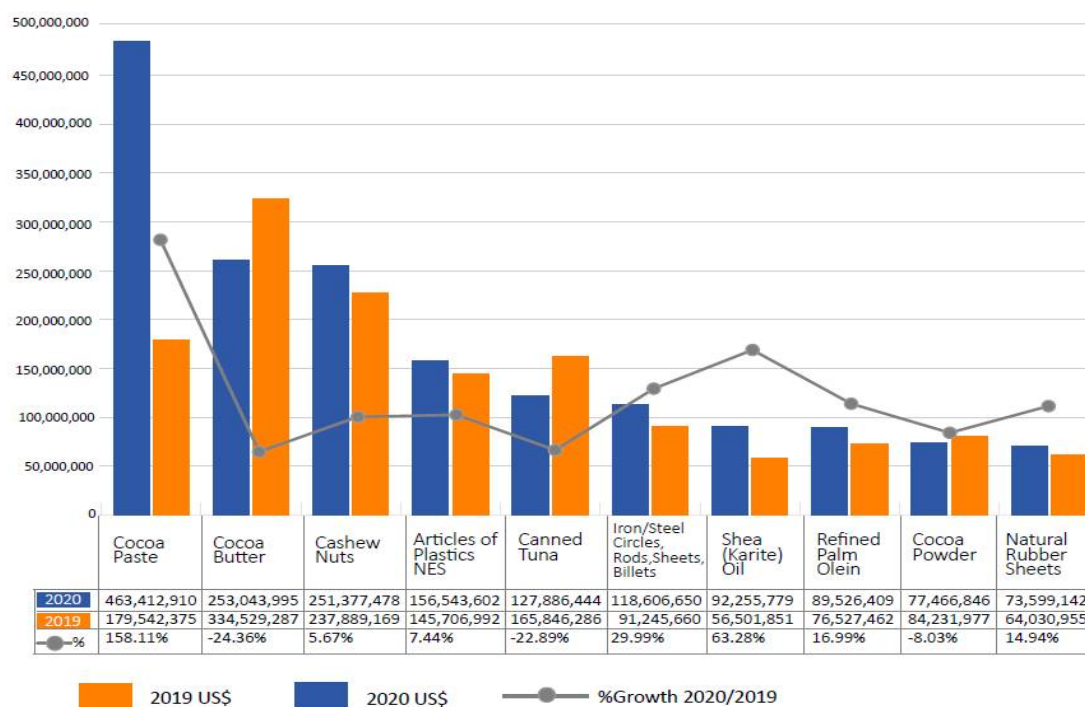
Ghana trades with both developing as well as developed nations and items traded includes minerals, cocoa beans, timber, processed and semi-processed items, agricultural raw materials, crude oil, technology hardware, bitumen and many more (GEPA, 2019; Okyere & Jilu, 2020). A renewed desire to expand the export revenue over the years led to the diversification of the export product basket since the traditional exports were exposed to external shocks and thus leading to dwindling export revenues. NTEs were introduced into the export basket to shore up

the export revenues. NTEs are classified broadly into three categories – agriculture, manufacturing (processed and semi-processed goods) and handicrafts (industrial art and craft) (GEPA, 2019). Agriculture products include cashew, banana, yam, pineapples, mangoes, flowers etc.; manufacturing NTEs includes canned tuna, cocoa butter, cocoa powder, aluminium sheets/coils/plates, iron steel products and handicrafts include ceramics, beads, batik tie & die, paintings, drawings and articles of jewellery (GEPA, 2019). The manufacturing (processed/semi-processed) sub sector was the highest contributing sub-sector to NTE in 2019, contributing about 85% of total NTE revenue.

In 2020, the performance of the subsectors followed a similar pattern with the manufacturing (processed/semi-processed) subsector accounting for 83.7% of the total NTEs for the year 2020, even that is a 2.94% decline over the earnings in 2019 (GEPA, 2020).

The top ten NTE products by value in 2020 contributed 59.85% of the total NTE earnings. All the products in the top ten product list were processed and semi-processed products with the exception of cashew nut which was the only agricultural product in the top ten list (GEPA, 2020). Figure 3 shows a comparative analysis of the top ten NTE products and their growth rate between 2019 and 2020.

Figure 3: Comparative analysis of top ten NTE products



Source: Annual NTE Report, (GEPA 2020)

2.2.5 Overview of Merchandise Imports in Ghana

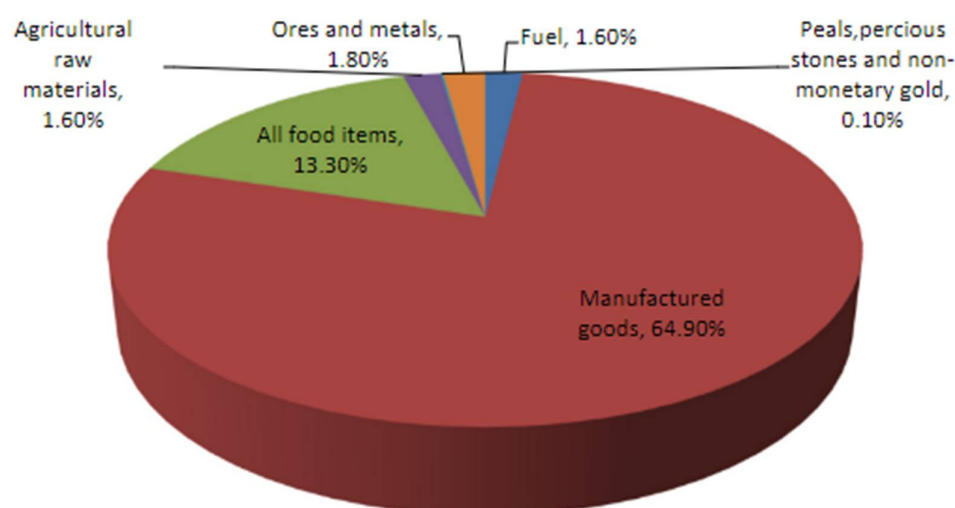
Imports, or merchandise imports, play a crucial role in the economic growth and development of most countries especially LDC's. It provides an avenue for countries to have access to the product and services that are not immediately available domestically and mostly include intermediary products and technology that help the productive capacity of countries to increase their export base.

Many countries, as a measure to enhance trade balance and to reduce the impact of the problem of insufficient foreign exchange, have attempted to reduce imports. This is very common with many emerging economies. They embark on the import substitution strategy of industrialization. Governments do this by either introducing import tariff and quota on goods or provide subsidies to firms engaged in the import substitution industries.

The World Trade Organization is the principal source organization for data on international trade including imports. The WTO says merchandise imports is the CIF value of goods received from the rest of the world in current US dollars (World Bank, 2022).

The import portion of Ghana’s international trade plays a major role in closing the gap in domestic supply by way of capital and intermediate goods and the high demand for goods imported. Ghana’s import trade has seen significant increases over the period. Total imports of goods to Ghana increased from \$1,205 million in 1990 to \$10,922 million in 2010, an increase of over 800% in 2 decades(GEPA, 2019). The trend analysis shows an ever-increasing import trade over the period. The major import products include manufactured products, fuel and food items, with manufactured products leading the import bill followed by food items as can be seen in Figure 4 below. The country trades with both emerging and developed countries (Okyere & Jilu, 2020).

Figure 4: Average annual composition of Ghana’s imports by product group (1995-2014)

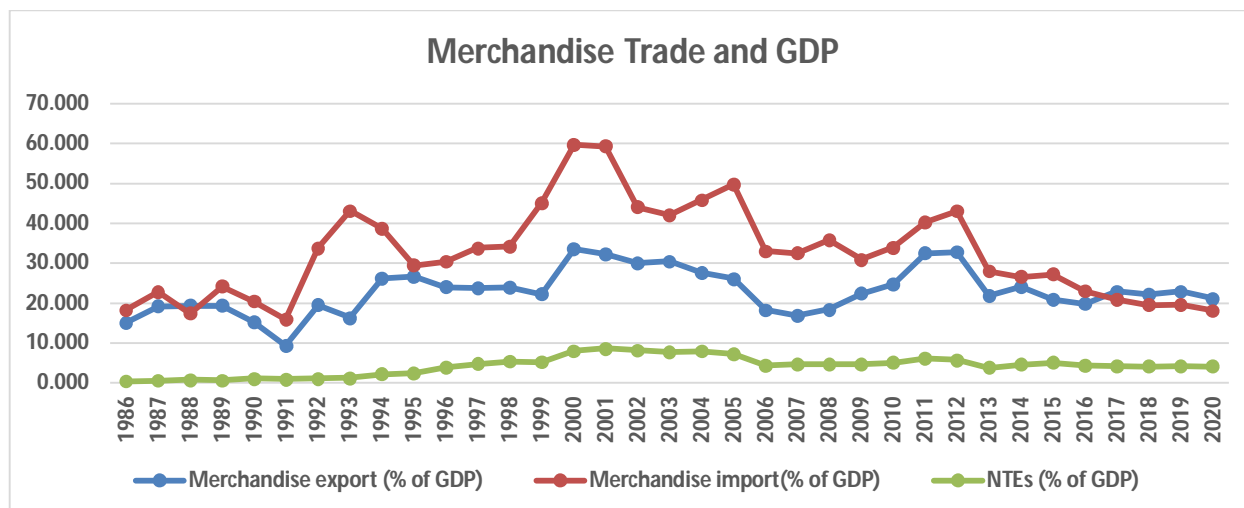


Source: Okyere & Jilu, 2020

Over the years imports have contributed greatly to the economic growth of Ghana. On the average, import’s contribution to GDP has been 32.6% between 1986 and 2020. Over this same period the average contribution of exports was 22.9% whilst NTEs contributed 4,25%. Indeed, it contributed almost 60% of GDP in the years 2000 and 2001. Imports contributed more to GDP than merchandise exports and NTEs within the period. Import value started to reduce from

the year 2012 as seen in figure 5. From 2017, merchandise export has contributed more to GDP than imports and NTEs.

Figure 5: Merchandise trade contribution to GDP



Source: Authors computation from WDI data, (WDI,2005)

Table 1: Summary of product list

Imports	Traditional Exports	Non-Traditional Exports
Manufactured goods.	Cocoa beans	Agricultural commodities
Fuel and petroleum products, bitumen, minerals,	Unprocessed minerals (Gold, diamond, bauxite and manganese)	Horticulture, fish products, game & wildlife, fresh fruits (pineapples, mangoes, banana, coconut, etc), yam, cashew, kola nut, corn, vegetables (okra, tinder, pepper etc)
Food items	Timber logs.	Manufacturing (Processed & semi-processed goods)
	Electricity	Canned tuna, cocoa powder, cocoa butter, iron stell products, aluminium sheets/coils/plates, wood products, electric cables etc
		Handicrafts (industrial art & craft)
		Carvings, ceramics, weaving products, wood works, ornamental items, beads, articles of jewellery, batik tie & die, paintings, drawings

Source: Authors compilation from literature

The major product list for imports in Ghana include manufactured goods, food items such as rice, wheat, poultry and soyabean meal, fuel and refined petroleum products, bitumen, minerals, vehicles, pearls and precious stones. The main import partners include China, United States of America, France, United Kingdom, Belgium Thailand, Vietnam etc. A summary of Ghana's product lists for imports, exports and non-traditional exports is captured in table 1 above.

2.3 Theoretical Framework

2.3.1 Economic Growth Theories

Various economic growth theories have evolved over the years that looked at the primary factors that influenced economic growth in nations. Starting from Adams Smith, he opined that economic productivity hinged primarily on labour force, capital, and land. His position was that capital accumulation is the driver for economic growth (Chibaya & Qi, 2018). David Ricardo improved this model by adding technology to the factors proposed by Adam Smith, arguing that economic growth results from foreign trade when countries focused on the production and export of goods and services in which they have the best comparative advantage (Nyasulu, 2013). Various economists followed thereafter putting forth different arguments to achieve economic growth. These included - Karl Max (1872) who opined that economic growth comes from the reinvestment of the society's surplus that will further generate more surplus value using labour, physical capital and technology; John Maynard Keynes (1936) who argued that economic growth could be achieved by increasing money supply and expanding government spend (Nyasulu, 2013).

Below, I proceed to review some economic growth theories and how they influence international trade (exports and imports).

2.3.2 Traditional Neoclassical Growth Theory

This growth theory argues that an increase in the quality and quantity of a country's labour force, technology and total capital stock will lead to economic growth. And Todaro (2009) in (Nyasulu, 2013) indicates that an "expansion in any of the above factors due to increasing returns to scale of inputs to outputs sparks an upsurge in the GDP levels over time". Apart from the above factors, the theory also envisages that some other factors such as foreign trade (exports and imports) significantly impacts growth. The model thus asserts that trade-induced GDP growth can be achieved from the movements of foreign capital and investments from countries where there are lower interest rates and higher input costs to those with higher rates

of return and lower input costs. Therefore, as Ghattak (1978) indicates in (Nyasulu, 2013), “open economies involved in international trade are more likely to see more growth than closed economies with no external trading activities”.

2.3.3 Endogenous Growth/New Growth Theory

According to Dasgupta (1998) in (Nyasulu, 2013), the new growth theory or endogenous growth theory “grew out of frustration with earlier neoclassical growth approaches’ failure to pinpoint the causes of the massive inequalities in the levels of national income between developing and developed nations as evidenced by the emergence of the Latin American debt crisis in the early 1980s”. Dasgupta states that this growth model differs from the neoclassical growth theory, whose primary focus is on “the principle of diminishing marginal returns” to the scale of the inputs to the level of output. Rather, it suggests that the factors of production allow a constant marginal return to productivity and capital formation.

This growth model views an increase in GDP as coming from internal production processes. In addition to this, Lal (1992) suggests in (Nyasulu, 2013) that unlike neoclassical economic growth theories, technology cannot be assumed to be a given. Endogenous models debate that the level of technology in the economy flows from international capital movements between developed countries and Least Developed Countries (LDCs) (Todaro & Smith, 2012). Therefore, it is through these international capital movements that the role of international trade (imports and exports) becomes truly relevant. In fact, LDCs exchange their export products, which are mainly primary commodities, for capital injections such as foreign direct investments, and technology from rich nations.

2.3.4 Export-Led Growth (ELG) Theory

Export-led growth, outward oriented, export promotion and export substitution are all phrases used to describe policies of countries that have done well with their export markets (Krugger, 1985). The position of exports as one of the critical factors for economic development is not a new phenomenon. Indeed, Adams Smith and David Ricardo, both classical economists, posited that international trade is especially important in the economic growth of a nation, producing the needed foreign exchange required for imports, improving the skills set of the workers and increasing the overall productive capacity of the domestic economy (Abou-Stait, 2005). Two prominent explanations given by export promotion proponents revolve around “absolute advantage and comparative advantage.” Adam Smith (1776) argues that a country gains

absolute advantage over others when it produces commodities at less input cost than rivals. However, David Ricardo (1817) improved this by arguing that comparative advantage occurs if a country can produce commodities at less real or opportunity cost than others (Nyasulu, 2013).

The Export-Led Growth (ELG) hypothesis remains the most prominent theoretical framework that guides and establishes the relationship between exports and economic growth. The ELG states that “export growth is one of the key determinants of economic growth” (Medina-Smith, 2001). This theory holds the view that, in general, the overall growth of a country is not only achieved through increasing capital and labour but also by increasing exports (Medina-Smith, 2001) and it sees export as the growth engine for economic development. A sizeable number of studies agree with the view that export-led growth leads to positive economies of scale, employment, and an increased economic growth (Shadab, 2021) and the growth of exports has a positive effect on economic growth (Balassa, 1977). As well, the ELG allows for “better utilisation of resources without discriminating against the domestic market” (Abou-Stait, 2005).

Many countries, especially the LDCs were thus encouraged to proceed with export orientation as it allows for specialization which leads to increased national output and a decreased domestic price level.

However, the ELG is not without criticisms. According to Carbaugh 2003, the reasons are three-fold. Firstly, the global demand for primary commodities produced in the LDCs has not gone up enough to overtake their supply and thus the producer countries will continue to see losses in the long run. Secondly, the price index for the ratio of exports to imports has always been favourable to the wealthy nations. Consequently, they prefer to purchase commodities from the LDCs at a rather low price and then in turn charge huge prices for their manufactured exports to the Third World. Thirdly, to the emergence of tariffs, there are quotas and other trade barrier restrictions against exports from the LDCs by developed countries. The emergence of high-quality manufactured products from some LDCs offers another reason for pushing for import-substitution as a displacement strategy for export promotion in LDCs.

2.3.5 Import-Led Growth Theory

The relationship between imports and economic growth is a bit more complicated, unlike the export-economic growth nexus, primarily because imports are seen as a leakage to the circular

flow of national income, that is, most import expenditure reduces national income resources. However, it is accepted that imports will help a country to acquire the needed productive factors that it cannot produce by itself due to the lack of the needed technology, labour force and skills. Analysis of the impact of imports on economic growth by Coe et al., (1997) in (Nyasulu, 2013) points to three avenues by which the desired impact is secured.

- The import of intermediate capital goods could increase a country's productive capital stock levels that will finally lead to economic growth.
- Imports increase GDP levels by enabling countries with low technological prowess such as the LDCs to adapt and adopt advanced technologies from the developed countries.
- Imports provides countries the opportunity to learn from others more efficient methods of resource allocation which will impact and result in increased national levels.

2.4 Empirical Literature

The relationship between exports, imports and economic growth has been widely studied by researchers in various empirical works. Most of the studies focused on specific countries and stressed the benefits of an outward trade arrangement of export promotion over import substitution which is seen as inward-looking. Several the studies considered both co-integration analysis and causality tests using annual time series data whilst focusing on the short-run and long-run relationship between the variables.

A study of the relationship regarding Italy using data on real export, import and real GDP from 1863–2004 showed compelling evidence that an increase in imports led to GDP growth in Italy that eventually led to growth in exports (Pistoresi & Rinaldi, 2012) . The study showed a strong bi-directionality between exports and imports, but the study does not support the export-led growth (ELG) theory. No long-run relationship was seen between exports and economic growth between 1914 and 1939.

In a study on India, testing the relationship between export, imports and economic growth using monthly data between April 2005 and March 2017, there was evidence to suggest a causal bidirectional relationship between exports growth and economic growth as well as imports and economic growth, supporting both the export-led growth and growth led exports hypothesis (Guntukula, 2018). In Egypt, using annual data from 1965 to 2015 and Johanssen co-integration analysis it was observed that in the long run, exports have negative impact on economic growth, defying the export-led growth hypothesis, whilst imports have a positive impact on economic

growth (Bakari, 2017b). On exports, this study showed that external factors such as political and economic situation of the region, compliance of export products with standards and quality specifications and the overall costs of producing the export products can play a significant role in the success of international trade.

Ali et al examined the impact of exports and imports on the economic growth of Somalia using data from 1970 to 1991. The study used Ordinary Least Squares (OLS) Technique together with Granger causality and Johansen Co-integration tests to understand the long-term associations. The findings showed that imports have a bidirectional causality with economic growth and exports growth leads to economic growth, but economic growth does not Granger cause exports thus the export-led growth hypothesis is supported in Somalia (Ali et al., 2018).

In another study by Bakari on the linkages between exports, imports, and economic growth in Tunisia, he used annual time series data for the period 1965 to 2016 through co-integration analysis and the vector error correction model to study the relationship between the variables. The results showed that in the short-term Tunisia's economy needed both imports and exports as they impacted the economy positively. However, in the long run, exports affect economic growth negatively whilst imports positively impact economic growth (Bakari, 2017c).

Ijuo and Andohol also examined the effect of exports on economic growth focusing on only agricultural exports in four West African countries (Ijuo & Andohol, 2020). These are Nigeria, Ghana, Cote d'Ivoire, and Benin, using data for the period 1982 to 2016 and adopting a panel field effect fixed method. Jointly, agricultural exports have a significant and positive impact on the economic growth of these countries. On a country-specific level, however, the results are mixed. Agricultural exports have an insignificant positive impact on the economy in Nigeria. For Cote d'Ivoire, agricultural exports have a significant but negative impact on economic growth. But for Ghana and Benin, agricultural exports show an insignificant negative impact of the economy (Ijuo & Andohol, 2020).

Shadab studied export diversification, imports, and economic growth in the United Arab Emirates (UAE) with data from 1975 to 2017 using the Vector Error Correction Model (VECM). The findings showed a direct significant long-run relationship between imports, export diversification and economic growth (Shadab, 2021). It also shows a one-way causal relationship from export diversification to economic growth. Abou-Stait in (Abou-Stait, 2005)

analysed the export-led growth pattern for Egypt, using historical data from 1977 to 2003 with various analytical tools including cointegration analysis, Granger causality tests and unit root tests. The results showed a long run relationship between GDP, exports, and imports. It also concludes that exports Granger cause growth in Egypt. In Malawi, two studies in 2013 and 2018 to assess the impact of foreign trade on the economic growth of the country gave comparable results. Using OLS as a tool for the analysis, both studies found a strong positive significant relationship between GDP and exports, but not same for imports (Chibaya & Qi, 2018; Nyasulu, 2013).

Another study on Fiji's growth outlook and export, using time series data from 2000 to 2015 and Ordinary Least Squares (OLS) regression analysis also established a strong positive relationship between exports and the economic growth in Fiji (Raj & Chand, 2017). Thus, Fiji's exports, which comprises primarily of agricultural and fisheries commodities, minerals, garments etc., and the resultant earnings contributes significantly to the economic growth of the country. Studying the relationship between exports, imports, and economic growth of the Palestinian economy, (Fannoun & Hassouneh, 2019) used quarterly data from 2000 to 2018 and Johansen's cointegration test together with vector error correction method. The findings showed a long-run equilibrium relationship between exports, imports, and economic growth as well as a bidirectional long-run causality between exports, imports, and economic growth (Fannoun & Hassouneh, 2019).

Abdulai & Jaquet (2002) studied the short and long-run relationship between GDP representing economic growth, export, real investment, and labour force in Ivory Coast for the period 1961 to 1997 using cointegration and error correction methods. The results indicate a causal relationship that flows from exports to GDP both in the short-run and long-run thus giving credence to the export-led growth hypothesis (Abdulai & Jaquet, 2002). Also in Gabon, (Bakari, 2017a) confirmed in a study of the impact of exports on economic growth with time series data for the period 1980 to 2015 using cointegration analysis and the error correction model. In the long run, investment and exports affect economic growth negatively but both variables have a positive impact on economic growth in the short run (Bakari, 2017a). Using an Autoregressive Distributed Lag (ARDL) bounds procedure on an annual time series data from 1960 to 2017 for Turkey, the study concluded that imports and economic growth have a cointegrating relationship and imports is significantly and positively related to economic growth in both the

short and long terms (Koyuncu & Unver, 2018). Also, there is a unidirectional causality from economic growth to imports.

Analysing how export growth relates to economic growth in eight (8) Asian developing economies, Ekanayake in (Ekanayake, 1999) used cointegration and error-correction models with annual data from 1960 to 1997. The results gave solid evidence in support of the export-led growth hypothesis. The results show that a bi-directional causality exists between export growth and economic growth in seven of the eight countries: India, Indonesia, Korea, Pakistan, Philippines, Sri Lanka, and Thailand. There is also evidence for export-led growth in Malaysia (Ekanayake, 1999). Again, Asafu-Adjaye & Chakraborty (1999) tested the export-led growth and the import-compression hypotheses for four less developed countries (LDCs), that is, India, Nigeria, Fiji and Papua New Guinea using unit root tests and Johansen's multiple cointegration tests. The results show causality from exports and imports to real output (Asafu-Adjaye & Chakraborty, 1999).

In Ghana, using the error correction model, researchers found that international trade leads to faster economic growth and is a key driver in poverty reduction (Yennu, 2018). Okyere & Jilu (2020) examined the impact of exports and imports on the economic growth of Ghana, using data from 1998 to 2018. Through the unit root and co-integration tests, the results showed that there is no significant causal relationship between import growth and GDP (Okkyere & Jilu, 2020). However, exports have a significant causal relationship with Ghana's GDP. Boakye & Gyamfi, 2017 researched the impact of foreign trade on the economic growth of Ghana and established that an increase in export leads to an increase in the economic growth of the country.

Table 2 shows a summary of all the studies and papers reviewed about the relationship between foreign trade and economic growth, the countries of interest, the specific variables considered, and the estimation techniques adopted. The review also looked at the limitations of the literature in Ghana.

2.5 Summary of the chapter

This chapter gave a brief description of the export environment in Ghana, particularly the non-traditional exports (NTE) and how it differed from the traditional export in the country. The chapter also reviewed the theoretical basis that relates the relationship between export, import and economic growth and explored various empirical studies from different countries. This

exploration indicated that exports and imports have varied impact on economic growth in different countries and thus it is necessary to establish what this relationship is, specifically for Ghana, and particularly for the NTEs. Hence the essence of this study. The next chapter will proceed to look at the methodology used for this research as well as the data utilised for this study and their sources.

Table 2: Summary of Empirical Literature reviewed.

No	Author (Year)	Country of focus	Findings	Dependent Variable	Independent Variable	Estimation Technique
1	Pistoresi & Rinaldi (2011)	Italy	Increase in import led to GDP growth and hence export growth	GDP	Exports, Imports	CA, GCT
2	Guntukula (2018)	India	Causal relationship exists between export growth and economic growth as well as imports and economic growth	GDP	Exports, Imports	URT, CA, GCT
3	Sayef Bakari (2017c)	Egypt	Exports have a negative impact on economic growth and imports have a positive impact on economic growth	GDP	Exports, Imports, Domestic Investment	CA, VEC, URT,
4	Ali et al., 2018	Somalia	Export growth leads to economic growth and imports have a bidirectional causality with economic growth	GDP	Exports, Imports	OLS, GCT, CA
5	Sayef Bakari (2017d)	Tunisia	Economic growth depended on both exports and imports in the short term; but in the long-term exports affect growth negatively and imports affect growth positively	GDP	Exports, Imports	CA, VEC
6	Ijuo & Andohol (2020)	Ghana & Benin	Agricultural exports have an insignificant negative impact on the economy	GDP	Agric Exports	URT, CA
7	Shadab (2021)	UAE	There exists a long-run relationship between imports, export diversification and economic growth	GDP	Export diversification, Human Capital, Physical Capital, Imports	URT, CA, VEC, VAR, GCT
8	Okyere & Jilu (2020)	Ghana	Exports have a significant causal relationship with GDP	GDP	Export, Import, Cocoa, Gold, Exchange rate, Inflation rate	URT, CA, GCT
9	Boakye & Gyamfi (2017)	Ghana	An increase in export leads to an increase in the economic growth	GDP	Current account balance (openness to trade), FDI, External debt per capita, Export per capita, Inflation, Remittances,	OLS
10	Yennu et al., 2018	Ghana	International trade leads to faster economic growth and reduction in poverty			
11	Fouad (2005)	Egypt	There is a long run relationship between GDP, exports & imports	GDP	Exports, Imports, Investment,	CA, GCT, URT, VAR, IRF
12	Raj & Chand (2017)	Fiji	Strong positive relationship between export and economic growth	GDP	Export	OLS
13	Ofori-Abebrese et al (2017)	Ghana	Trade openness showed a significant negative impact on economic growth. Thus, higher trade with the world	GDP	Trade Openness	CA, URT, ADF

No	Author (Year)	Country of focus	Findings	Dependent Variable	Independent Variable	Estimation Technique
14	Chibaya (2018)	Malawi	The impact of foreign trade on Malawi economic growth	GDP	Exports, Imports, Gross Capital Formation, Labour force	OLS
15	Nyasulu (2013)	Malawi	There is a strong positive meaningful relationship between GDP and export but not so for imports	GDP	Export, Import, Labour, Capital Stock	OLS
16	Fannouh & Hassouneh (2019)	Palestine	There is a long--run equilibrium relationship between exports, imports, and economic growth	GDP	Exports, Import	CA, VEC
17	Koyuncu & Unver (2018)	Turkey	Imports is both positively and significantly related to economic growth in the short -term and long-term	GDP	Imports	ARDL, ECM
18	Abdulai & Jaquet (2002)	Côte d'Ivoire	There is a long-run equilibrium relationship among the variables. There is causality from growth in exports to growth in GDP both in the short-run and long-run	GDP	Exports, Real investments, Labour force	CA, ECM
19	Ekanayake (1999)	8 Asian Countries	Bi-directional causality exists between export growth and economic growth, confirming the export-led growth hypothesis	GDP	Exports	CA, ECM, GCT
20	Asafu-Adjaye & Chakraborty (1999)	India, Nigeria, Fiji & Papua New Guinea	Granger causality exists from exports and imports to real output	GDP	Exports, Imports	CA, ECM

Note: CA – Co-integration analysis; ADF – Augmented Dickey-Fuller; GCT – Granger Causality Tests; VEC – Vector Error Correction; URT – Unit Root Test; OLS – Ordinary Least Squares; VAR – Vector Auto Regression; RF – Impulse Response Function; ECM – Error Correction Model; ARDL – Autoregressive Distributed Lag.

Source: Authors compilation of reviewed literature

CHAPTER 3

METHODOLOGY

3.1 Introduction

This section discusses the approach to the research, the methods used and how they were designed. It begins with an understanding of the data sources and sizes used in the study and an argument for the use of a quantitative approach. Thereafter, all the variables considered in the model, based on the empirical review, are defined, and properly situated within the context of the country under study and a brief discussion on the estimation technique is done.

3.2 Research approach

The study was conducted using a quantitative research method. The ARDL cointegration methodology was used. Since the study seeks to establish relationships and understand the effect of the independent variables on the dependent variable, a quantitative approach was deemed appropriate. Also, all the examples of previous empirical studies related to the subject matter used quantitative research analysis (Bakari, 2017c; Musila & Yiheyis, 2015; Shadab, 2021) etc.

3.3 Research design

3.3.1 Data sources and period

The study was done using annual time series data on the variables from 1986 through to 2020. The unit of analysis is the country of Ghana, and the data is secondary data from credible organizations. These are the World Development Indicators (WDI) and the Ghana Export Promotion Authority (GEPA). This is to ensure consistency in the data collection method and regime, due to ease of access and cost-effectiveness. Admittedly, secondary data sources may not be full proof for uses other than what it was originally collected for, but it does provide the best option for this study.

The secondary data was sourced from the World Development Indicators (WDI), May 2022 database of the World Bank and the Ghana Export Promotion Authority (GEPA). The variables of interest are the economic growth measured by GDP growth as the dependent variable, merchandise imports, non-traditional exports (NTEs) both measured in USD, gross capital

formation (GCF) as a percentage of GDP and inflation as the independent variables. Inflation and GCF are used as control variables in the analysis to see their relationship with the dependent variable (Ali et al., 2018; Okyere & Jilu, 2020). All the data for the variables are sourced from the WDI apart from the NTE export data that is sourced from the GEPA.

3.3.2 Empirical model

The export-growth hypothesis assumes that growth in export leads to a significant economic growth reflected in an increase in the GDP growth. Several empirical studies did capture this by incorporating exports into the production and thus economic growth function (Abdulai & Jaquet, 2002). The model that is used for this study to establish the relationship between the variables is specified to include exports (in this case NTEs) and imports, which are the variables of interest. Since the main objective of the study is to examine the export-led growth hypothesis, the model proposed by Fosu (1990) in (Abdulai & Jaquet, 2002) is adopted as follows:

$$Y = f(K, L, X) \tag{1}$$

Where Y = real output of aggregate production

K = capital inputs

L = variable used to indicate the labour force

X = current level of exports

In the neoclassical growth model, the impact of international trade on economic growth as studied by Feder (1987) and Ram (1990) in (Chibaya & Qi, 2018) must always include exports and imports. And Abou-Stait opines in (Abou-Stait, 2005) that imports are a critical variable when considering the causality between exports and growth. Thus, the adopted model from Feder and Ram is:

$$Y = f(K, L, EX, IM) \tag{2}$$

Where

Y = aggregate level of output

K = Capital stock

L = Labour force

EX = Exports

IM = Imports

The GDP growth is used as a proxy for the aggregate level of output, exports represented by NTEs and capital stock by GCF (as a % of GDP) net inflows (balance of payment, current US dollars). The Gross capital formation (GCF), previously called gross domestic investment, includes outlays in additions to the fixed assets of the economy plus net changes in the level of inventories. Fixed assets include land improvements (fences, ditches, drains, and so on); plant, machinery, and equipment purchases; and the construction of roads, railways and the like, including schools, offices, hospitals, private residential dwellings, and commercial and industrial buildings. Inventories are stocks of goods held by firms to meet temporary or unexpected fluctuations in production or sales and "work in progress." According to the 1993 SNA, net acquisitions of valuables are also considered capital formation (World Bank, 2022).

Labour refers to the proportion of the population who are 15 years and older and are economically active. This data is not available for portions of the period of study, that is, from 1980 to 1990. This variable is therefore excluded in the analysis without any effect on the impact of NTEs and imports on the GDP growth. Inflation is also used as a control variable in the model (Okyere & Jilu, 2020).

Therefore, the model adopted for use in this study is approximated as

$$\mathbf{GDP\ growth = f(NTE\ exports, Imports, GCF, Inflation)} \quad (3)$$

This is also consistent with models adopted from the analytical techniques used in most of the empirical literature (Aigheyisi, 2020; Bakari, 2017a; Bakari & Mabrouki, 2017; Fannoun & Hassouneh, 2019).

From (3),

$$\mathbf{GDP\ growth = f(NTE, IMP, GCF, INF)} \quad (4)$$

Where

NTE = NTE exports

IMP = imports, represented by the merchandise imports

GCF = Gross Capital Formation

INF = Inflation

The econometric form of the model in (4) is thus expressed as

$$GDP\ Growth_t = \beta_0 + \beta_1 NTE_t + \beta_2 IMP_t + \beta_3 GCF_t + \beta_4 INF_t + \alpha_t \quad (5)$$

Where

β_0 = Constant or intercept of the model

$\beta_1 - \beta_4$ = coefficient of the independent variables

α = error term

The expected relationship of the independent variables with GDP growth therefore is to have a positive relationship. Thus:

$$\beta_1 \beta_2 \beta_3 \beta_4 > 0$$

3.3.3 Definition and measurement of variables

In this section, the definition of the variables in the model and how they are measured is discussed. The expected relationship, as provided for in the empirical literature, is also indicated.

Dependent variable

Several global institutions and bodies such as the World Bank, IMF etc. and studies have used the GDP growth as a good measure of the economic growth and performance of a country. Therefore, the GDP growth of Ghana is used as the measure of the growth of the economy over the period of the study. From the literature, several empirical studies also used GDP and GDP growth as a good proxy of the overall growth of the economy (Boakye & Gyamfi, 2017; Okyere & Jilu, 2020).

The GDP growth (annual %), as measured by the WDI, refers to the annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2015 prices, expressed in U.S. dollars. 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. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources (World Bank, 2022).

Independent variables

The variables of interest in this study are the regressors whose impact on and their relationship with the economic growth of Ghana is being assessed. These are the independent variables. This is based on the available theoretical and empirical literature which include exports (NTE in this case), imports, GCF (as a % of GDP) and inflation. Inflation is used as a control variable to establish the relationship with GDP growth as found in a number of the empirical studies (Boakye & Gyamfi, 2017; Okyere & Jilu, 2020).

Exports & Non-Traditional Exports

Several studies have shown a direct relationship between exports and GDP growth. These studies argue that exports, among other things, generate foreign exchange that can be used to secure the needed technology, goods and services that cannot be produced locally (Abou-Stait, 2005; Ali et al., 2018; Boakye & Gyamfi, 2017). Few studies such as (Bakari, 2017d) also suggest that exports cause increased economic growth only in the short term but in the long term it affects economic growth negatively. Thus, an increase in exports in general, and by extension the NTE is expected to lead to an increased economic growth for Ghana.

In this study, the WDI indicator of merchandise exports, which represents the F.O.B value of goods provided to the rest of the world and valued in current US dollars (World Bank, 2022) is used. NTE value is the annual total volume in earnings from the non-traditional export sub-sector as captured by the GEPA in their annual flagship publications – the Annual Export Performance Reports.

Imports

Merchandised import shows the C.I.F value of goods received from the rest of the world valued in the current US dollars (World Bank, 2022). Imports have also been shown to impact positively on the economic growth of countries. A causal and long-run relationship exists between imports and economic growth and thus an increase in imports leads to an increase in economic growth (Guntukula, 2018; Pistorresi & Rinaldi, 2011; Shadab, 2021).

According to Reizmann et al (1996) in (Abou-Stait, 2005), imports are an important variable when considering the causality between exports and growth and therefore neglecting imports will lead to biased results. Thus, imports should feature in any methodology that seeks to evaluate for the causality between exports and economic growth using the ELG theory. The expected relationship is to have imports positively and significantly impact the economic growth of Ghana (Boakye & Gyamfi, 2017; Okyere & Jilu, 2020).

Gross Capital Formation

Capital formation, also described as investment, is the net accumulation of capital goods such as equipment, tools, transportation assets and electricity during an accounting period for a particular country. Gross capital formation relates to economic growth in diverse ways (Pavelescu, 2008) and is supported by economic growth theories. But in general, the higher the capital formation (capital stock) of an economy, the faster the economy can grow its aggregate income (de Long & Summers, 1990) leading to cumulative expansion that causes GDP growth over a period (Chibaya & Qi, 2018).

It is “the acquisition, less disposals, of fixed assets plus major improvements to, and transfer costs on, land and other non-produced assets. The assets acquired may be new or they may be used assets that are traded on second-hand markets. The assets disposed of may be sold for continued use by another economic unit, they may be simply abandoned by the owner, or they may be sold as scrap and be broken down into reusable components, recoverable materials, or waste products” (OECD, 2009).

Empirical literature has established the presence of a strong positive relationship between investment captured by gross capital formation and economic growth as captured by (de Long & Summers, 1990; Levine & Renelt, 2016; Mankiw Gregory et al., 1992; Meyer & Sanusi, 2019). The data used for this variable is taken from the WDI and it is sourced from the International Monetary Fund (IMF) balance of payments database. The expected relationship with economic growth is a significant positive relationship.

Inflation

Inflation typically measures the general rise in the price of goods and services. In this study, inflation as measured by the consumer price index is used. This is a measure of the “annual

percentage change in the cost to the average consumer of acquiring a basket of goods and services which could be fixed or modified at specified intervals” (World Bank, 2022). Inflation is expected to have a negative relationship with economic growth as a decrease in inflation is expected to lead to an increase in economic growth. In Tanzania, a study showed that there is no statistically significant relationship between inflation and economic growth in the long run, but a negative and statistically significant relation exists in the short run (Kasidi & Mwakanemela, 2013).

Table 3: Description and sources of variables

Variables	Source	Description
Dependent variable		
GDP growth	WDI	GDP growth (annual %) of the country
Independent Variables		
Annual NTE Volumes	GEPA	Total value of NTE per year
Merchandise Import	WDI	Total value of imports per year
Inflation	WDI	Consumer price index
GCF (% of GDP)	WDI	Net capital accumulation

Source: Author’s compilation of data sets

3.4 Estimation approach

This study used a time series data analysis to understand the relationship between all the variables and economic growth. An ARDL regression estimation technique is used to estimate this relationship. Several diagnostic tests are conducted on time series data to ascertain the suitability of an appropriate estimation technique on the data.

3.4.1 Unit Root Test

Time series analysis starts with the unit root test to determine the stationarity of the variables (Shrestha & Bhatta, 2018). Using OLS models to estimate and test hypothesis of any time series data is premised on the assumption that the means, variances, and covariance of the time series have constant mean and are not dependent on time. Otherwise, the series is deemed non-stationary thus rendering any OLS based analysis unreliable. Test for stationarity is therefore important before proceeding with any analysis. Several methods can be used to test stationarity but the two most popular are: The Augmented Dickey-Fuller (1981) test and the Philips and

Perron (1988) test (Asafu-Adjaye & Chakraborty, 1999). This study used ADF as it is the most common and easiest to use. For a non-stationarity time series, the series ought to be differenced to make it stationary (Chibaya & Qi, 2018). The order of integration refers to the number of times the series needs to be differenced to make them stationary.

There are three regression models that drive the form of an ADF test. One of these is illustrated by the equation below.

$$Y_t = \beta_1 + \gamma Y_{t-1} + \sum_{i=1}^m \alpha_i Y_{t-i} + \varepsilon_t$$

Where Y is the series, ε_t is the error term and m are the optimal lag length.

The test is carried out using the following hypothesis:

Null hypothesis - $H_0: \gamma = 0$ (data is non-stationary)

Alternative hypothesis - $H_1: \gamma < 0$ (data is stationary)

The ADF value is normally compared to the critical values. The results that are on the low side of the critical values will confirm the presence of unit roots and consequently, the nonstationary of the series.

3.4.2 Heteroscedasticity Test

The concept of heteroscedasticity refers to the situation where the errors terms in a time series differ in their scatter plots irrespective of the values of the explanatory variables This leads to a constant standard error term.

3.4.3 Cointegration Test

Cointegration is an econometric concept that can copy the presence of a long-run equilibrium among underlying economic time series that converges over time (Nkoro & Uko, 2016). First introduced by Robert Engle and Clive Granger in 1987, Cointegration is useful when one wants to establish whether there is a correlation between several time series in the long term. It helps to identify situations where two or more non-stationary time series are integrated together (CFI, 2022). “Testing for cointegration is a necessary step to establish if a model empirically exhibits meaningful long run relationships” (Nkoro & Uko, 2016). There are two methods for testing

cointegration – Engle Granger method and Johansen estimation test. ARDL is a recent and a third method for testing cointegration. Johansen cointegration test cannot be applied directly if the variables of interest are of mixed order of integration or all of them are not non-stationary, as this approach requires that all the variables be of order I(1) (Shrestha & Bhatta, 2018). Also, the two-steps of Engle-Granger method and Johansen estimation test are considered as outdated cointegration techniques whilst the ARDL is seen as “a new and an advanced technique” (J. Ofori-Abebrese et al., 2017).

This study uses the ARDL bound test for cointegration. The ARDL is an OLS based model that can be applied to both time series which is non-stationary and time series which is of mixed order (Shrestha & Bhatta, 2018). Apart from being one of the most popular techniques used from the empirical literature analysed (Koyuncu & Unver, 2018; G. Ofori-Abebrese et al., 2017), the technique has other advantages compared to the other cointegration techniques. These include the ability to compute the long-run and short-run parameters of the model at the same time and has no requirement for pre-testing the order of integration of the variables under study (Pesaran et al., 2001). Also, ARDL is seen as a better option when assessing cointegration relationships in small samples (Ofori-Abebrese et al., 2017).

This study used the ADF test for stationarity to ensure that none of the variables in the model is integrated of order two I (2).

From the estimated model for the regression of this problem, which is

$$GDP\ Growth_t = \beta_0 + \beta_1 NTE_t + \beta_2 IMP_t + \beta_3 GCF_t + \beta_4 INF_t + \alpha_t$$

The ARDL model is given by the following expression:

$$\begin{aligned} \Delta GDPGRO_t = & \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta GDPGRO_{t-1} + \sum_{i=1}^p \beta_{2i} \Delta NTE_{t-1} + \sum_{i=1}^p \beta_{3i} \Delta IMP_{t-1} \\ & + \sum_{i=1}^p \beta_{4i} \Delta GCF_{t-1} + \sum_{i=1}^p \beta_{5i} \Delta INF_{t-1} + \beta_{6i} GDPGRO_{t-1} + \beta_{7i} NTE_{t-1} \\ & + \beta_{8i} IMP_{t-1} + \beta_{9i} GCF_{t-1} + \beta_{10i} INF_{t-1} + \alpha_t \end{aligned}$$

The first part of the model with β_{1i} to β_{5i} represent the short-run dynamics of the model whilst the portion with β_{6i} to β_{10i} represents the long-run relationships. The hypothesis testing of the coefficients is as follows:

$$H_0: \beta_{6i} = \beta_{7i} = \beta_{8i} = \beta_{9i} = \beta_{10i} = 0 \text{ (non-existence of long-run relationship)}$$

$$H_1: \beta_{6i} \neq \beta_{7i} \neq \beta_{8i} \neq \beta_{9i} \neq \beta_{10i} \neq 0 \text{ (The existence of long-run relationship)}$$

With the long-run relationships established through the cointegration test, the short-run relationship is equally considered. The ARDL is reparametrized into the Error Correction Model (ECM), thus indicating the short-run dynamics and long-run relationships of the control variables (Pesaran et al., 2001).

3.4.4 Vector Error Correction Model (VECM)

The use of the VECM is valid when the time series variables have been found cointegrated (Shadab, 2021). The test helps to confirm the significance of the long-run relationship between the variables and as well indicate the direction of the causal relationship between the time series variables. For the model to converge towards equilibrium, the expected sign of the Error Correction Term (ECT) coefficients should be negative (Shadab, 2021). ECT values typically range between 0 and -1. However, there are instances where the values can go beyond -1, exhibiting that the ECT gives a less intense fluctuation of the dependent variable about the equilibrium (Narayan & Smyth, 2006).

3.5 Summary of the chapter

The chapter looked at the data sources and data collection procedures utilised in the study. An outline of the econometric model and techniques used in testing the hypothesis of the study were also discussed. A description of the variables, their sources, measurement, and the expected signs was presented in the chapter. The chapter proceeded to describe the estimation techniques and further explained the various tests performed on the model, including unit root tests, co-integration and the ARDL estimation tests. The next chapter presents the research findings as well as a detailed discussion and analysis of the findings.

CHAPTER 4

DISCUSSION OF FINDINGS

4.1 Introduction

This chapter discusses the data analysis and models generated from the data in assessing the relationship that exists between NTE, imports and the economic growth measured by GDP growth. The chapter shows and discusses the descriptive statistics and the correlation analysis of the variables in the models, followed by the unit root tests. It continues with a section on cointegration analysis that looks at the long-run relationship between the variables. Thereafter, there is a section on the ARDL bound test and diagnostics test that assess the appropriateness of the models generated. The chapter ends with a summary of the key observations made in the analysis of the data.

4.2 Descriptive Statistics

Descriptive statistics are the first insights drawn about the data and the variables in the study. Table 4 below shows the summary descriptive statistics of the variables present in the econometric models. The average GDP growth rate for the period under study is 5.29% with a minimum value of 0.41% and a maximum value of 14.05%. The average merchandise import for the period is \$6.72B, which is more than six times the value of the average NTE export of \$1.07B for the same period.

Table 4: Descriptive Statistics

Variables	Mean	SD	Min	Max	Skew	Kur	JB
GDP Growth	5.29	2.39	0.41	14.05	1.41	6.71	31.72***
NTE	1.07	1.05	0.02	2.90	0.61	1.72	4.52
Imports	6.72	5.59	0.91	17.76	0.61	1.85	4.10
Inflation	20.91	12.97	4.87	59.46	1.13	3.68	8.18**
GCF	19.90	5.53	9.36	29.00	-0.20	1.97	1.79

*** significant at 1% level, ** significant at 5% level

Source: Author's computation of results from EViews

It is also evident that the series of GDP growth and inflation is not normal as the Jarque – Berra test provides evidence to reject the null hypothesis of normality due to P – values less than 0.05. Other series are normal as their P – values are greater than 0.05 providing evidence to accept the null hypothesis of normality. The Jarque-Bera normality test evaluates whether the data series matches a normal distribution (Mulenga, 2019; Pesaran et al., 2001). The null hypothesis

for the Jarque-Bera test is that the series is normal against the alternative that the series is not normal.

The standard deviation shows that NTE has the least variability of 1.05 about its mean whilst inflation has the highest variability of 12.97 about its mean value.

Skewness is a measure of symmetry for the data. For a series to be symmetrical, the value of skewness should be equal to zero or at least close to zero. Departure from zero on either side indicate the presence of skewness or lack of symmetry in the data. The values of skewness for GDP growth and inflation are above 1, indicating that both series are positively skewed. The values of skewness for other series are close to zero indicating the symmetrical behaviour of the series. The skewness for NTE is 0.61 while the kurtosis is 1.72. The value of skewness here is also close to zero indicating the symmetry of the data series, while a value less than 3 for kurtosis indicates that the normal curve is slightly flatten. The value of skewness for inflation series is 1.13 indicates that the series is right skewed. The value of kurtosis is 3.68 which is close to 3 showing the curve is normal. Jarque-Bera p – value probability for inflation is 0.02 indicating a rejection of the null hypothesis and thus it can be concluded that the series of inflation is not normally distributed.

Kurtosis of a series is a measure of the peakness of the data. If the value is close to 3, it indicates the moderate peak also known as meso – kurtic curve. Values above zero indicates a higher peak, known as leptokurtic while value below 3 indicates a flatter peak, known as platykurtic. Values from the table shows that most of the series are platykurtic. The series of GDP growth is leptokurtic while the series of inflation is mesokurtic.

4.3 Unit root test

Unit root test is the first step of the empirical analysis, and it is used to check the stationary level of the data used in the analysis and indicates the level of integration each variable has. This is needed because the bounds test requires that the dependent variable is integrated at order one and the explanatory variables are expected to be at $I(0)$ or $I(1)$ (Keho, 2017). This is because the F-test results become biased if any variable is found to be of order $I(2)$ (Keho, 2017). The study used the Augmented Dickey Fuller (ADF) unit root test to verify and conclude on the stationarity status of the variables.

The null hypothesis for the stationary test is stated as there is a unit root in the series, or the series is not stationary. This is set against the alternative hypothesis that the series is stationary. Table 5 shows the results from the ADF unit root analysis of the data, showing the unit root test results for each of the variables from the EViews computational output.

Table 5: Unit root test results

ADF test		
Variables	Level	First difference
GDP Growth	-3.3258**	-6.6500***
NTE	0.6469	-4.7384***
Imports	1.0760	-3.9471***
Inflation	-3.4084**	-6.5294***
GCF	-2.9666**	-5.1747***

*Mackinnon (1996) one sided p-values

Source: Author's computation of results from EViews

The results indicate that GDP growth, inflation and GCF are stationary at level while NTE and Imports are stationary at first difference. This is a key requirement for the dependant variable to meet to proceed to use the ARDL bound test for the cointegration analysis.

For NTE, the unit root results show a p-value (probability) that is higher than 0.05, therefore we have enough evidence to accept the null hypothesis and conclude that NTE is not stationary at level. But at first difference, the p-value (probability) is less than 0.05. We therefore reject the null hypothesis and conclude that NTE is stationary.

Same applies to merchandise Imports (IMP) where the p-value is above 0.05 suggesting the presence of enough evidence to accept the null hypothesis. Thus, it can be concluded that Imports (IMP) is not stationary at level. It is however stationary at first difference with a p-value lower than 0.05 from Table 5 and thus we have enough evidence to reject the null hypothesis.

The GCF variable shows unit root results with a p-value lower than 0.05, thus providing good evidence to reject the null hypothesis and thus conclude that GCF is stationary at level. However, at first difference, it indicates a rejection of the null hypothesis. It can be concluded therefore that GCF is not stationary at first difference.

The results for inflation (INF) shows that it is stationary at level since the p-value is less than 0.05. We therefore have enough evidence to reject the null hypothesis and conclude that Inflation is stationary at level. Thus, the unit root analysis results show a mixture of stationarity at both level and first difference for the variables in the model. Table 6 shows a summary of the stationarity of the variables.

Table 6: Summary of stationarity of the variables

Variable	Level	First difference
GDP Growth	Stationary	Non-Stationary
NTE	Non-stationary	Stationary
IMP	Non-stationary	Stationary
GCF	Stationary	Non-Stationary
INF	Stationary	Non-stationary

Source: Author's compilation of Unit Root tests from EViews

As noted from the above unit root test results, the variables GDP Growth, GCF and Inflation are stationary at level while NTE and Imports are stationary at first difference. Therefore, the econometric model involved in this study is a mixture of $I(0)$ and $I(1)$ variables as shown in Table 5. When such a situation arises in the econometric analysis, that is, when variables are integrated at level and first difference, conventional cointegration methodologies may produce incorrect results. In such cases ARDL approach is more appropriate than the conventional methodologies (Pesaran et al., 2001).

4.4 Correlation analysis

The correlation between the variables is analysed next. The results can be seen in Table 7. The results show that the correlation between dependent and independent variables is of moderate level while some independent variables also have a strong correlation present between them. The null hypothesis for this test is that there is no correlation between the variables against an alternative that the variables are correlated.

The first observation is that the correlation coefficient for few of the variables in the study are more than 0.5. Also, it confirms the expected relationship of the dependent variable, GDP Growth, with all the independent variables in the estimation except Imports and GCF. All the variables are positively correlated with GDP Growth except inflation and GCF. There is the

presence of multicollinearity as there is a high positive correlation between some independent variables - NTE and Imports.

A time series data with independent variables that shows a common trend such as all increasing or decreasing over time could exhibit multicollinearity (Gujarati & Porter, 2009). That may be a high correlation. However, they also suggest that despite the presence of some multicollinearity, the assumptions of the regression will not be automatically breached as there will still be the presence of impartial, compatible estimates with the right standard errors. Therefore, according to (Gujarati & Porter, 2009), variables should not be taken out if the model variables rightly belong to the model even in the presence of some level of correlation (Gujarati & Porter, 2009). Also, in many instances the effect of multicollinearity is reduced through the first difference of the regression model. This is because there is no inferred reason to suggest that the differences of variables will be highly correlated, even though initially they may have been highly correlated at level (Gujarati & Porter, 2009).

Multicollinearity is resolved with the estimation of two models, with each involving one of the independent variables.

Table 7: Correlation analysis

Variables	GDP Growth	NTE	Imports	Inflation	GCF
GDP Growth	1.00				
NTE	0.26***	1.00			
Imports	0.40**	0.96*	1.00		
Inflation	-0.30	-0.57	-0.57	1.00	
GCF	-0.30	0.24*	0.19*	-0.02	1.00

*Significant at 10%, **significant at 5%, ***significant at 1%. Source: Author's compilation of Correlation analysis results

4.5 Cointegration analysis: ARDL approach

Cointegration analysis is the next test after the unit root tests as discussed in the previous chapter. It assesses the presence of long-term relationship between the variables involved in the econometric model. When variables are integrated of the same order, that is when all variables are $I(0)$ or $I(1)$, Johnson cointegration is a more appropriate methodology to investigate the long-term relationship among the variables. When variables are integrated of different order, and there is a mixture of $I(0)$ and $I(1)$ variables, ARDL bound test is the appropriate methodology to check the long-run relationship (Pesaran et al., 2001).

ARDL Estimation:

The following are the two models estimated using the ARDL approach.

$$GDP\ Growth_t = \beta_0 + \beta_1 NTE_t + \beta_2 GCF_t + \beta_3 Inflation_t \quad Model\ 1$$

$$GDP\ Growth_t = \beta_0 + \beta_1 Imports_t + \beta_2 GCF_t + \beta_3 Inflation_t \quad Model\ 2$$

4.6 ARDL Bound Test

ARDL bound test is a methodology used to assess the long-term relationship between the variables. ARDL bound test gives two bound values and a calculated test F-statistic. Decision about cointegration is made using the rule that, if the calculated statistic is less than the lower bound value, indicated as $I(0)$, then there is no cointegration of the variables. And if the calculated F-statistic is greater than the upper bound, $I(1)$ value, then there is cointegration among the variables. However, if the calculated value of the statistic falls between the upper and lower bounds, the decision is inconclusive or undetermined (Pesaran et al., 2001). The results obtained from the bound test analysis of the estimated models are shown in Table 8:

Table 8: ARDL Bound Test

		10%		5%		1%	
	F - Stat	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
Model 1	6.9511	2.37	3.2	2.79	3.67	3.65	4.66
Model 2	5.4836						

Source: Author's compilation from EViews

The result from the analysis indicates that the calculated F – stats for both models are greater than the upper bound value at 1% level of significance. Thus, it can be concluded that there is convincing evidence of cointegration and a long-run relationship among the variables in both econometric models.

4.7 Long-run coefficients

Having established the presence of a long-run relationship among the variables, I proceed to estimate their coefficients. The long-run coefficients extracted from the ARDL bound testing approach for both models are as captured in Table 9.

Table 9: ARDL Long-run Coefficients

Variable	Model 1	Model 2
NTE	0.0822 (0.1490)	
Imports		0.2037*** (0.0270)
GCF	-0.0540* (0.0284)	-0.0471* (0.0228)
Inflation	-0.0070 (0.0098)	0.0314* (0.7167)

*** significant at 1% level, ** significant at 5% level, * significant at 10% level
Standard errors are in parenthesis

Source: Author's compilation from EViews

As evident from Table 9, the coefficient of non-traditional exports (NTE) is positive in model 1 but insignificant. This means that even though a direct positive relationship exists between NTE and GDP Growth in the long run there is no impact of NTE on GDP growth as its P – value is above 0.05. Thus, if NTE increased by one unit, the GDP Growth of Ghana will increase by an average of 0.08%. A similar result is seen for inflation whilst the coefficient of GCF is significant at 10% level of significance. This coefficient is interpreted as one percent increase in GCF causes GDP growth to decrease by 0.05 percent on average. These results are aligned with the findings of empirical studies on Ghana, Cote D'Ivoire, India and many other emerging economies (Abdulai & Jaquet, 2002; Boakye & Gyamfi, 2017; Guntukula, 2018; Keho, 2017; Okyere & Jilu, 2020). This is an indication of an empirical support for the export-led growth theory in Ghana in the long run when it comes to the NTEs. Secondly, it also confirms that high NTE volumes is very instrumental in achieving increases in the economic growth in Ghana. This is also the case because GDP as computed includes the NTEs and therefore (Keho, 2017) posits that a positive relationship is expected between the two variables. Exports create jobs and increase employment, influence the expenditure balance, and increase wealth and economic growth (Okyere & Jilu, 2020). Thus, an export-oriented strategy, both in volume and diversification, is critical to the growth of the Ghanaian economy. The economy is hugely dependent on external trade and in 2021 total exports accounted for 29.9% of total GDP (World Bank, 2022).

In Model 2, the coefficient of imports is highly significant and positive which can be interpreted as a unit increase in imports will lead GDP growth to increase by 0.2 percent on average. The coefficient of imports is positive and significant at 1% and is interpreted as a direct relationship existing between merchandise imports and GDP growth in the long run. A unit increase in

imports will lead to GDP growth of Ghana to increase marginally by 0.2% on the average. Therefore, the null hypothesis that there is no relationship is rejected. This gives an indication that the country's economic growth in the period under study was enhanced by the import trade, albeit not hugely. This finding on imports is in line with that of (Koyuncu & Unver, 2018) who indicates that imports have a positive impact on economic growth represented by GDP when there is a trade deficit created by high volumes of merchandise imports that exceeds exports. Akbay (2011) in (Bakari & Krit, 2017) posited that imports enhanced the growth on the Turkish economy for the period of 1998 to 2010. Fannoun & Hassouneh (2019) suggests that imports do have a positive effect on economic growth as they provide jobs, knowledge, and technology to local firms to enhance local manufacturing (Fannoun & Hassouneh, 2019). The World Bank indicates that imports of intermediate goods and capital goods has a positive impact on the growth of any economy (World Bank, 2017). Secondly, a high level of import is an indication of robust domestic demand and a growing economy. However, if these imports are not for productive assets like machinery and technology that will help expand the economy but are towards consumption goods, then the impact on the economic growth will not be extraordinarily strong. With this, it does appear the imports into the Ghanaian economy is mostly towards consumption instead of productive assets and technology. The finding on imports also contradicts the conclusions of other studies done earlier, including that on Mauritania, using data between 1960 and 2015 which showed that imports have negative effect on economic growth (Bakari & Krit, 2017).

The coefficient of GCF is similar and depicts the same type of relationship in both models 1 and 2. The coefficients in both models are negative and insignificant at 10% level. They can be interpreted as a one percent increase in GCF will cause GDP growth to decrease by 0.05 percent on the average. This finding contradicts the expected results of a positive significant relationship with economic growth represented by GDP growth as posited by (de Long & Summers, 1990; Levine & Renelt, 2016; Mankiw Gregory et al., 1992; Meyer & Sanusi, 2019) who observed a significant positive relationship between GCF and economic growth. The findings however align with the results by (Pavelescu, 2008) which suggests that the effect of GCF can be a negative impact on economic growth. Some other researchers such as (Hafnida Hasan, Mohammad Salem Oudat, 2021) however have no confirmed result on the relationship between GCF and economic growth.

Inflation has mixed relationship with economic growth. In model 1 it has an insignificant negative relationship with GDP growth. This direction is the expected result. In model 2, the coefficient of inflation is positive and insignificant at 10% level and interpreted as a one percent increase in inflation will cause GDP growth to increase by 0.03 percent on average.

This finding contradicts the expectation. The null hypothesis that inflation has no relationship with the economic growth of Ghana is rejected. It is seen that inflation has an insignificant and yet a positive impact on GDP growth in the long run in the economy of Ghana. This finding aligns with the study by (Boakye & Gyamfi, 2017) which also found the impact of inflation on economic growth to be insignificant and positive. This means that inflation does not on its own influence the economic growth in Ghana but impacts growth together with other macroeconomic indicators. This also corroborates the study by Akoto (2021) on the combined effect of inflation and interest rates on Ghana. He established that the impact of inflation is always combined with other factors and concluded that inflation and interest rates are highly and positively correlated and an increase in inflationary rates will lead to an increase in interest rates which also results in a decline in the rate of economic growth (Akoto, 2021). Thirdly, an examination of the impact of inflation and other macroeconomic factors such as government expenditure, physical capital and money supply on growth showed a positive effect of general level inflation and low-level inflation on the economic growth of Ghana (Kankpeyeng et al., 2021). At high inflationary rates, a negative impact is observed on economic growth. And in yet another study, inflation becomes injurious to economic growth when it goes above a critical value of 17.45% (Prempeh et al., 2022).

4.8 Short-run coefficients

The ARDL bound test method estimates both long-run and short-run parameters simultaneously (Keho, 2017). The short -run coefficients are also known as the ECM version of ARDL are presented in Table 10. It shows the short – run coefficients for both model 1 and model 2. The short-run results give an idea on how the variables in the models relate to the GDP growth of the country.

On GDP growth, the results show that the first and second lags of GDP growth is very significant at 10% level. From the coefficients, a percentage increase in the GDP growth of the previous year will increase the current GDP growth rate by 0.85%. And a percentage increase

in the previous second years' GDP growth will increase the current GDP growth rate by 0.49%. However, the third lag will cause GDP growth to decrease by 0.17% in the short run.

For NTEs, the short-run results indicate that current NTE levels together with the first, second and third lags all significantly and positively impact the GDP growth. A unit increase in NTE levels will raise GDP growth by 11.63%, which is very significant. Similarly, the impact on the GDP growth is 11.85%, 8.22% and 8.38% for a unit increase in the first, second and third lags of NTE respectively.

On imports, as shown in model 2, the results indicate that both the contemporaneous values and lags are very significant at 10% level on GDP growth. The results show that a unit increase in the contemporaneous term of imports will bring a resultant increase in GDP growth by 1.52% whilst the previous year's imports (first lag term) will cause GDP growth to rise by 0.95%. Both the second and third lags of imports positively impacts GDP growth by 0.59% and 0.95% respectively.

The first lag of GCF has a significant causal effect on GDP growth at 1% and 5% respectively in model 1 and model 2. A percentage rise in the previous year's GCF will cause GDP growth to rise by 0.13% and 0.18% respectively in model 1 and model 2. On inflation, the results show that both the contemporaneous term and lags do have insignificant causal effect on GDP growth at the 5% level. A percentage increase in the first lag of the term will cause GDP growth to decline by 0.05%.

The coefficient of error correction term is also an important parameter to interpret. "The error correction term represents the long-run relationship. A negative and significant coefficient of the error correction term indicates the presence of a long-run causal relationship" (Mishra, 2011). This coefficient should be negative and significant as it indicates the presence of a long-run relationship or cointegration.

It provides evidence for long – term relationship (also known as cointegration) among the variables and can be used as a cross-checked method for the results obtained by ARDL bound testing approach.

Table 10: ARDL Short-run coefficients

Variable	Model 1	Model 2
ΔGDP_{t-1}	0.8450*** (0.2228)	1.2992*** (0.3620)
ΔGDP_{t-2}	0.4866*** (0.1476)	0.6349*** (0.1951)
ΔGDP_{t-3}	-0.1654 (0.1086)	-
ΔNTE	11.6258*** (1.5573)	-
ΔNTE_{t-1}	11.8493*** (2.6234)	-
ΔNTE_{t-2}	8.2195*** (2.4460)	-
ΔNTE_{t-3}	8.3822*** (2.7000)	-
$\Delta Imports$	-	1.5212*** (0.1995)
$\Delta Imports_{t-1}$	-	0.9474*** (0.2763)
$\Delta Imports_{t-2}$	-	0.5859 (0.3410)
$\Delta Imports_{t-3}$	-	0.9528*** (0.3171)
ΔGCF	0.0039 (0.0573)	-0.0166 (0.0604)
ΔGCF_{t-1}	0.1274* (0.0658)	0.1809** (0.0737)
$\Delta Inflation$	-	0.0145 (0.0177)
$\Delta Inflation_{t-1}$	-	-0.0541** (0.0220)
$Inflation_{t-2}$	-	-0.0306 (0.0194)
EC_{t-1}	-2.3774*** (0.3628)	-2.9453*** (0.4998)

*** significant at 1% level, ** significant at 5% level, * significant at 10% level
Standard errors are in parenthesis

Note: NTE=Non-Traditional export; IMP=Merchandise Import; GCF= Gross Capital Formation; INF=Inflation. ***, ** & * denote significance at 1%, 5% and 10% respectively.

Source: Author's compilation from EViews

The coefficient of error correction term which is presented as EC_{t-1} is negative and significant at the 1% level. This is the desired result for the presence of cointegration. It indicates the presence of cointegration among the variables for both models and is consistent with the error

correcting behaviour via oscillatory convergence (Achua et al., 2022). This error correction coefficient is particularly important in indicating the speed of adjustment. The speed of adjustment toward equilibrium is determined by the magnitude of the coefficient, in forcing the model back to the long-run state (Zivot & Wang, 2005). The greater the coefficient the higher the speed of adjustment of the model from the short run to the long run.

Ideally the coefficient of the ECT should be between 0 and 1. The results however show values of less than -1 for both models, an indication that the correction structure is oscillatory in nature (Bashir et al., 2022). According to Nayan and Smyth (2006), an ECT coefficient that is lower than -1 points to an error rectifying process that oscillates around the new long-run equilibrium in a less intense or dampening fashion (Narayan & Smyth, 2006). The period for the adjustment from disequilibrium to a steady state is often calculated as $1/ECT$ (Achua et al., 2022).

4.9 Diagnostic test

To confirm the validity of the estimated model and its goodness of fit, diagnostic tests are performed to check the appropriateness of the models and the results they produced. These tests also verified the accuracy of the model. The following are the diagnostic tests used for model 1 and model 2.

- i. LM test
- ii. Heteroscedasticity test
- iii. Normality test

4.9.1 LM test

It is a test to assess the serial correlation in the residuals of models. For an appropriate model, there should be no correlation present in the residuals. The null hypothesis for the test is stated as there is not the problem of serial correlation in the residuals of models against the alternative hypothesis that there is a problem of serial correlation in the residuals of model. From the results of the LM serial correlation test in Table 11, the p-values for both models are above 0.05, we therefore have evidence to accept the null hypothesis and it can be concluded that there is no serial correlation present in the residuals of model 1 and model 2 which is the desired property.

4.9.2 Heteroscedasticity (Breusch-Pagan-Godfrey test)

The second diagnostic test used is the Breusch-Pagan-Godfrey test. It is the test which assesses the heteroscedasticity in the residuals of the model. The null hypothesis for the test states that there is no heteroscedasticity present in the residuals of the model as against the alternative hypothesis which indicates that there is a problem of heteroscedasticity in the model. From the results of the Breusch-Pagan-Godfrey test shown in Table 10, the P – values for both models are above 0.05, thus we have evidence to accept the null hypothesis and it can be concluded that there is no heteroscedasticity present in both models 1 and 2.

Table 11: LM serial correlation test

Diagnostic test		
	Model 1	Model 2
LM Test	3.2329 (0.1986)	2.9151 (0.2328)
Heteroscedasticity test	6.2722 (0.9357)	18.3256 (0.2459)

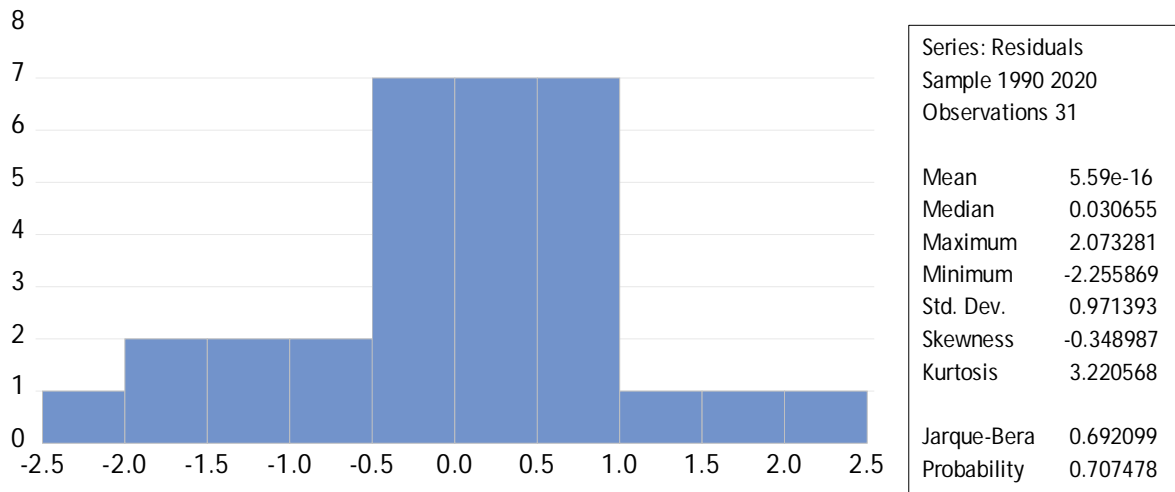
P – values are presented in parenthesis

Source: Author's compilation of results from EViews

4.9.3 Normality test

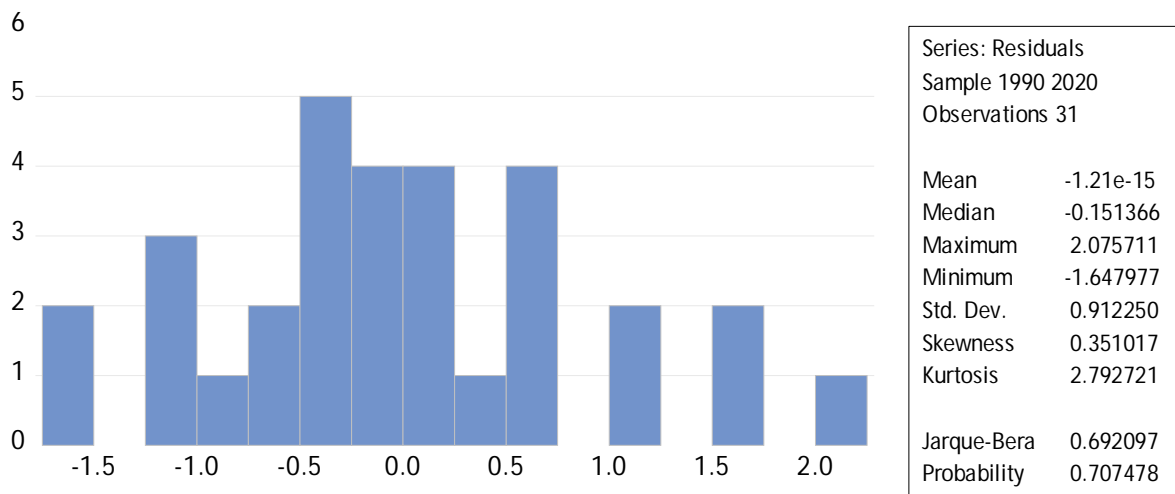
Normality test has been used to assess the normality of the residuals obtained from model 1 and model 2. Figure 6 and figure 7 show the results as well as normal plot of residuals for model 1 and 2, respectively. It is evident from the Jarque – Berra test that the residuals of both models are normal which is a desired post estimation property of a good regression model.

Figure 6: Normality test for model 1



Source: Author's compilation from EViews

Figure 7: Normality test for model 2



Source: Author's compilation from EViews

4.10 Summary of the chapter

The chapter presented, discussed, and interpreted the findings from the ARDL bound test model estimated for the study. The stationarity of the variables was confirmed through a unit root test to start with using the ADF unit root test. This established the non-stationarity of two variables at level namely NTE and IMP. These variables were found to be stationary at first difference. Three variables GDP growth, GCF and INF were found to be stationary at level. This provides

good evidence towards the use of ARDL bound test for the extraction of short and long-run coefficients.

The cointegration analysis with the ARDL bound test confirmed the existence of long-run relationship among the variables. Then the long-run coefficients were determined. The short-run estimates were also determined in the ECM with two models estimated for the variables. This pointed to an insignificant positive relationship between GDP growth and NTE in the long run. Imports however have a positive significant relationship with GDP growth in the long run. The impact of GCF and inflation is negatively insignificant in both short- and long-term periods and positively insignificant, respectively. Thereafter the validity and goodness of fit of the model was ascertained through diagnostic tests. This showed that the model satisfies the assumptions of serial correlation, normality and conditional heteroscedasticity from LM and Breusch-Pagan tests. The next chapter provides a summary of the critical findings of the study and offers a conclusion. It also gives policy recommendations from the findings in the empirical analysis of how the NTE and imports relates with the economic growth of Ghana.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the key findings, conclusions and policy implications arising out of the results from the empirical analysis of the impact of the NTE and imports on the economic growth of Ghana. The concluding section of the chapter looks at areas possible for further research.

5.2 Summary and conclusions

The study began with a focus on understanding the specific contribution of the NTE trade and imports on the economic growth of Ghana using GDP growth as an indicator of economic development. The absence of a specific and isolated study of the impact of the NTEs on the economic growth of Ghana motivated this research. The study used annual time series data from 1986 to 2020, a timeframe influenced partly by the availability of NTE annual data from the GEPA. The study provided both theoretical and empirical research review about the relationship that exists between exports, imports, and the economic development of various countries particularly emerging economies. The methodology used for the study was also discussed.

The ADF unit root test confirmed stationarity of the variables in the study and observed that the GDP growth, GCF and inflation are stationary at level whilst the other variables are stationary at first difference. ARDL method of cointegration established the presence of a long-run relationship among the variables and the bound test provided the long-run coefficients of the model. The short-run coefficients were estimated using the ECM to confirm the relationship among the variables in the short run.

The results indicated that in the long run NTE has a positive insignificant relationship with GDP growth. However, in the short run, NTE has a positive significant relationship with GDP growth. The positive relationship between these variables is consistent with the expectation of the study as well as some empirical studies conducted by (Guntukula, 2018; Nyasulu, 2013; Okyere & Jilu, 2020; Raj & Chand, 2017). However, the results indicate that the current volumes of NTE may not have a significant relationship with the economic growth of the country in the long run. NTEs are more effective on the growth of the economy due to the

multiplier effect of the different positive shocks from the contemporaneous and lag terms of NTE on GDP growth. A unit increase (positive shock) in NTE and its lags in the short run will produce a resultant increase in economic growth as shown in model 1. This effect is not seen with a unit increase (positive shock) in NTE in the long run. Correspondingly, GCF has a negative insignificant relationship, which is an inverse relationship, with GDP growth in both the short run and long run. This contradicts the expectations of the study and is inconsistent with empirical research by (Levine & Renelt, 2016; Mankiw Gregory et al., 1992; Meyer & Sanusi, 2019). Imports have a positive significant relationship with GDP growth as shown from model 2 in both the short-run and the long-run as expected by the study. This is also consistent with previous studies by (Boakye & Gyamfi, 2017; Fannoun & Hassouneh, 2019; Raj & Chand, 2017). The analysis also shows that inflation (INF) has an insignificant relationship with GDP growth both in the short and long run, contradicting the expectations of a negative significant relationship of this study but confirming the research by (Boakye & Gyamfi, 2017).

5.3 Policy recommendations

The contribution of the NTE subsector to the growth of the Ghanaian economy, even though minimal is a positive value. This study has shown that a 1% increase in the total value of NTE leads to an increase in GDP growth by 0.08% with all other things being held constant. This calls for deliberate policy efforts and guidance on enhancing the existing NTE basket and exploring options to increase the commodities in the NTE basket. The government, through the sector regulator, the GEPA, should be very intentional at the interventions, such as incentives and support schemes for the actors in the space to achieve this. Such support can be through technical assistance and financial support.

The study also shows that a unit increase in imports will increase GDP growth in the long run by 0.20%. There should be relevant policy interventions on import enhancement, particularly the imports of production driven assets and technology. Import substitution should also be deliberately looked at, especially on goods with local substitutes as a way of increasing the NTE component of the export basket and the overall productive capacity of the country.

5.4 Avenues for future research

Further research can be carried out on the same subject in the future with an expanded time frame for the data sets to periodically assess the impact of the NTEs. Future studies can also include an assessment of the specific contribution of each of the commodity groups within the

NTE basket to the economic growth of Ghana. The impact of economic growth on the NTE subsector can also be evaluated in future studies. Lastly, a measure of the quality of institutions can be included as a control variable in future analysis to assess the impact they bring on the growth of both NTEs and imports.

References

- Abdulai, A., & Jaquet, P. (2002). Exports and economic growth: Cointegration and causality evidence for Côte d'Ivoire. *African Development Review*, 14(1), 1–17. <https://doi.org/10.1111/1467-8268.00043>
- Abou-Stait, F. (2005). Are exports the engine of economic growth? An application of cointegration and causality analysis for Egypt, 1977-2003. In *AfDB - Economic Research Working Paper Series* (Issue 2). (no. 76) Economic Research Working Paper , African Development Bank. <https://doi.org/10.15408/sjie.v7i2.6177>
- Achua, J. K., Yusuf, M., & Wakdok, S. S. (2022). Nonlinear public debt and resource rent nexus in highly indebted resource-rich sub-Saharan economies: Evidence from Nigeria. *Resources Policy*, 79(September), 102983. <https://doi.org/10.1016/j.resourpol.2022.102983>
- Aigheyisi, O. S. (2020). Does the export-led growth (ELG) hypothesis hold for services exports in Nigeria? *West African Financial and Economic Review*, 20(12), 26–60.
- Akoto, D. (2021). The relationship between interest rates and inflation in Ghana and their Impact on economic growth for the period 2006-2019. *Journal of Finance and Economics*, 9(1), 34–41. <https://doi.org/10.12691/jfe-9-1-4>
- Ali, A. A., Yassin, A., Ali, S., & Dalmar, M. S. (2018). The impact of imports and exports performance on the economic growth of Somalia. *International Journal of Economics and Finance*, 10(1), 110–119. <https://doi.org/10.5539/ijef.v10n1p110>
- Amadeo, K. (2021, July 31). What Is economic growth? *The Balance*. <https://www.thebalance.com/what-is-economic-growth-3306014>
- Apalatoya, P. (2018). *Empirical investigation into the determinants of non-traditional exports growth in Ghana: A gravity model of trade approach* (Issue 10599198). (MPhil Thesis) Department of Economics, University of Ghana. <https://ugspace.ug.edu.gh/handle/123456789/34348?show=full>
- Asafu-Adjaye, J., & Chakraborty, D. (1999). Export-led growth and import compression: Further time series evidence From LDCs. *Australian Economic Papers*, 38(2), 164–175. <https://doi.org/10.1111/1467-8454.00049>
- Bakari, S. (2017a). *The long run and short run impacts of exports on economic growth: Evidence from Gabon*. (MPR Paper No. 79871) Munich Personal RePEc Archive. <https://mpra.ub.uni-muenchen.de/79871/>

- Bakari, S. (2017b). The relationship between export, import, domestic investment and economic growth in Egypt: Empirical analysis. *EuroEconomica*, 2(36), 34–43. <https://econpapers.repec.org/RePEc:dug:journl:y:2017:i:2:p:34-43>
- Bakari, S. (2017c). The three-way linkages between export, import and economic growth: New evidence from Tunisia. *Journal of Smart Economic Growth*, 2(3), 13–53. <https://jseg.ro/index.php/jseg/article/view/24/24>
- Bakari, S. (2017d). Why is South Africa Still a Developing Country ? *MPRA*, 80763.
- Bakari, S., & Krit, M. (2017). The nexus between exports, imports and economic growth: Evidence from Mauritania. *International Journal of Economics and Business Research*, 5(1), 10–17. <https://www.researchgate.net/publication/316511118>
- Bakari, S., & Mabrouki, M. (2017). Impact of exports and imports on economic growth: New evidence from Panama. *Journal of Smart Economic Growth*, 2(1), 67–79.
- Balassa, B. (1977). Exports and economic growth. *Journal of Development Economics*, 5(7), 181–189. <https://doi.org/10.1007/BF02927961>
- Bashir, M. F., Khan, T., Bin Tariq, Y., & Akram, M. (2022). Does capital flight undermine growth: a case study of Pakistan. *Journal of Money Laundering Control*. <https://doi.org/10.1108/JMLC-07-2022-0100>
- Boakye, R. N., & Gyamfi, E. (2017). The impact of foreign trade on the economic growth of Ghana. *International Journal of Business Marketing and Management*, 2(3), 20–26.
- Buatsi, S. N. (2002). Financing non-traditional exports in Ghana. *Journal of Business and Industrial Marketing*, 17(6), 501–522. <https://doi.org/10.1108/08858620210442848>
- Chibaya, N., & Qi, C. (2018). *The impact of foreign trade on Malawi economic growth*. (Thesis) School of International Trade and Economics, Jiangxi University of Finance and Economics.
- de Long, J. B., & Summers, L. H. (1990). Equipment investment and economic growth: How strong is the nexus? *Brookings Papers on Economic Activity*, 2, 157–211. https://www.brookings.edu/wp-content/uploads/1992/06/1992b_bpea_delong_summers_abel.pdf
- Ekanayake, E. M. (1999). Exports and economic growth in developing countries: Cointegration and error-correction models. *International Advances in Economic Research*, 5(1), 147–148.
- Fannoun, Z., & Hassouneh, I. (2019). The causal relationship between exports, imports and economic growth in Palestine. *Journal of Reviews on Global Economics*, 8, 258–268. <https://doi.org/10.6000/1929-7092.2019.08.22>

- Fosu, A. K. (2001). *Emerging Africa: The case of Ghana*. (Working Paper) African Economic Research Consortium, Nairobi. <http://hdl.handle.net/1834/448>
- GEPA. (2016). *Non-Traditional Export Performance Report 2015*. <https://www.gepaghana.org/market-information/ghana-annual-nte-export-statistics/>
- GEPA. (2019). *Report on analysis of non-traditional export statistics*. (NTE Report) GEPA, Ministry of Trade & Industry.
- GEPA. (2020). *Report on analysis of non-traditional export statistics*. (NTE Report) GEPA, Ministry of Trade & Industry. <https://www.gepaghana.org/export-statistic/gepa-annual-report-2019-full-version-2/>
- Guntukula, R. (2018). Exports, imports and economic growth in India: Evidence from cointegration and causality analysis. *Theoretical and Applied Economics*, 25(2), 221–230.
- Habanabakize, T. (2020). The effect of economic growth and exchange rate on imports and exports: The South African post-2008 financial crisis case. *International Journal of Economics and Finance Studies*, 12(1), 223–238. <https://doi.org/10.34109/ijefs.202012114>
- Hafnida Hasan, Mohammad Salem Oudat, B. J. A. A. (2021). Relationship among export, import and economic growth: Using Co-Integration Analysis. *Psychology and Education Journal*, 58(1), 5126–5134. <https://doi.org/10.17762/pae.v58i1.2068>
- Ijuo, O. A., & Andohol, J. (2020). Agricultural exports and economic growth in selected West African countries. *World Academics Journal of Management*, 8(1), 29–39.
- Kankpeyeng, J. G., Maham, I., & Abubakar, M. (2021). Impact of inflation on gross domestic product growth in Ghana. *Ghana Journal of Development Studies*, 18(2), 117–137. <https://doi.org/10.4314/gjds.v18i2.6>
- Kasidi, F., & Mwakanemela, K. (2013). Impact of inflation on economic growth: A case of Tanzania. *Asian Journal of Empirical Research*, 3(4), 363–380. <https://doi.org/10.1038/253011b0>
- Keho, Y. (2017). The exports and economic growth nexus in Cote D ' Ivoire : Evidence from a Multivariate Time Series. *Asian Journal of Economic Modelling*, 5(2), 135–146. <https://doi.org/10.18488/journal.8/2017.5.2/8.2.135.146>
- Koyuncu, C., & Unver, M. (2018). *Is there a long-term relationship between imports and economic growth? The case of Turkey*. Paper presented at the 8th IBANESS Congress, Plovdiv, Bulgaria, April 21-22. https://www.researchgate.net/publication/324861151_Is_There_a_Long_Term_Relationship_between_Imports_and_Economic_Growth_The_Case_of_Turkey

- Levine, R., & Renelt, D. (2016). A sensitivity analysis of cross-country growth regressions. *The American Economic Review*, 82(4), 942–963.
- Mankiw Gregory, N., Romer, D., & Weil, D. N. (1992). A contribution to the empirics of economic growth. *Quarterly Journal of Economics*, 107(2), 407–437. <https://doi.org/10.2307/2118477>
- Medina-Smith, E. J. (2001). *Is the export-led growth hypothesis valid for developing countries? A case study of Costa Rica* (Issue 7). (UNCTAD/ITCD/TAB/8) United Nations Conference on Trade and Development. https://unctad.org/system/files/official-document/itcdtab8_en.pdf
- Meyer, D. F., & Sanusi, K. A. (2019). A causality analysis of the relationships between gross fixed capital formation, economic growth and employment in South Africa. *Studia Universitatis Babeş-Bolyai Oeconomica*, 64(1), 33–44. <https://doi.org/10.2478/subboec-2019-0003>
- Mishra, P. K. (2011). The dynamics of relationship between exports and economic growth in India. *International Journal of Economic Sciences and Applied Research*, 4(2), 53–70. <http://hdl.handle.net/10419/66632www.econstor.eu>
- Mulenga, B. (2019). *Determinants of life insurance consumption: Evidence from Zambia*. (MCom in Development Finance Thesis) Graduate School of Business, University of Cape Town, South Africa.
- Musila, J. W., & Yiheyis, Z. (2015). The impact of trade openness on growth: The case of Kenya. *Journal of Policy Modelling*, 37(2), 342–354. <https://doi.org/10.1016/j.jpolmod.2014.12.001>
- Narayan, P. K., & Smyth, R. (2006). What determines migration flows from low-income to high-income countries? An empirical investigation of Fiji-U.S. migration 1972-2001. *Contemporary Economic Policy*, 24(2), 332–342. <https://doi.org/10.1093/cep/byj019>
- Nkoro, E., & Uko, A. K. (2016). Autoregressive Distributed Lag (ARDL) cointegration technique: Application and interpretation. *Journal of Statistical and Econometric Methods*, 5(4), 63–91.
- Nyasulu, T. (2013). *Assessing the impact of exports and imports on economic growth: A case study of Malawi from 1970 to 2010*. (MEcon in Development Studies Thesis) Faculty of Economic and Management Sciences, University of the Western Cape, South Africa. <https://etd.uwc.ac.za/handle/11394/4475>
- Obeng, C. K. (2021). *Export efficiency and diversification in Ghana*. A final report submitted to the African Economic Research Consortium, Nairobi, Kenya.

- <http://publication.aercafricalibrary.org/bitstream/handle/123456789/3341/PB771Eng.pdf?sequence=1&isAllowed=y>
- OECD. (2009). *Measuring capital: OECD manual* (2nd ed.). Organisation for Economic Co-operation and Development. <https://www.oecd.org/sdd/productivity-stats/43734711.pdf>
- Ofori-Abebrese, G., Pickson, R. B., & Diabah, B. T. (2017). Financial Development and Economic Growth: Additional Evidence from Ghana. *Modern Economy*, 08(02), 282–297. <https://doi.org/10.4236/me.2017.82020>
- Ofori-Abebrese, J., Pickson, R. B., & Ofori-Abebrese, G. (2017). Commodity prices, exchange rate and economic growth in West Africa: Case study of Cote d’Ivoire and Ghana. *Journal of Development and Agricultural Economics*, 9(9), 269–277. <https://doi.org/10.5897/JDAE2017.0842>
- Okyere, I., & Jilu, L. (2020). The impact of export and import to economic growth of Ghana. *European Journal of Business and Management*, 12(21), 130–138. <https://doi.org/10.7176/ejbm/12-21-15>
- Pavelescu, F.-M. (2008). Gross capital formation and economic growth during early 2000’s in EU-member and candidates states. *Romanian Journal of Economics*, 25(1), 1–12.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16(3), 289–326. <https://doi.org/10.1002/jae.616>
- Pistoresi, B., & Rinaldi, A. (2012). Exports, imports and growth: New evidence on Italy 1863–2004. *Explorations in Economic History*, 49(2), 241–254. <https://doi.org/10.1016/j.eeh.2011.11.003>
- Potters, C. (2021, January 1). What is economic growth and how is it measured? *Investopedia*. <https://www.investopedia.com/terms/e/economicgrowth.asp>
- Prempeh, K. B., Kyeremeh, K., & Peprah-Amankona, G. (2022). *Does the level of inflation matter in the inflation-growth nexus in Ghana?* (Unpublished Paper) Sunyani Technical University, Ghana. <https://doi.org/10.2139/ssrn.4094213>
- Presidential Report, P. (2000). *Ghana – vision 2020: The first step 1996-2000*. Presidential report on Co-ordinated Programme of Economic and Social Development Policies.
- Raj, S. K., & Chand, P. P. (2017). Analysis of Fiji’s export and its impact on economic growth. *International Journal of Business and Social Research*, 7(3), 1–14.
- Shadab, S. (2021). The nexus between export diversification, imports, capital and economic growth in the United Arab Emirates: An empirical investigation. *Cogent Economics & Finance*, 9(1), 1–15. <https://doi.org/10.1080/23322039.2021.1914396>

- Shrestha, M. B., & Bhatta, G. R. (2018). Selecting appropriate methodological framework for time series data analysis. *Journal of Finance and Data Science*, 4(2), 71–89. <https://doi.org/10.1016/j.jfds.2017.11.001>
- Todaro, M. P., & Smith, S. C. (2012). *Economic development* (11th ed.). Pearson.
- World Bank. (2022). *Databank: World development indicators*. <https://databank.worldbank.org/reports.aspx?source=2&series=BN.GSR.GNFS.CD&country=GHA#>
- Yennu, A. T. (2018). International trade and economic growth in Ghana: Benefits, constraints and impacts. *Scholar Journal of Applied Sciences and Research*, 1(2), 18–22. www.innovationinfo.org
- Zivot, E., & Wang, J. (2005). *Modelling financial time series with S-PLUS* (2nd ed.). Springer.

APPENDICES

Appendix 1: Data Set for Analysis

Year	GDP growth (annual %)	NTE (BUSD)	Imports (BUSD)	Inflation, CPI (annual %)	GCF (% of GDP)
1986	5.1992	0.0238	1.0460	24.5654	9.3621
1987	4.7949	0.0280	1.1560	39.8151	10.4340
1988	5.6282	0.0423	0.9050	31.3593	11.2960
1989	5.0859	0.0347	1.2730	25.2237	13.2090
1990	3.3288	0.0623	1.2050	37.2591	14.4440
1991	5.2818	0.0626	1.0550	18.0314	15.8790
1992	3.8794	0.0678	2.1690	10.0561	12.8000
1993	4.8500	0.0717	2.5750	24.9598	22.2102
1994	3.3000	0.1193	2.1080	24.8703	23.9577
1995	4.1124	0.1597	1.9060	59.4616	20.0214
1996	4.6025	0.2762	2.1080	46.5610	21.2000
1997	4.1964	0.3291	2.3260	27.8852	24.8062
1998	4.7004	0.4017	2.5630	14.6242	23.1094
1999	4.4000	0.4044	3.4800	4.8654	21.0005
2000	3.7000	0.4007	2.9730	40.2409	23.9986
2001	4.0000	0.4596	3.1540	41.5095	26.5994
2002	4.5000	0.5043	2.7200	9.3609	19.7000
2003	5.2000	0.5889	3.2100	29.7730	22.9369
2004	5.6000	0.7054	4.0740	18.0427	28.3775
2005	5.9000	0.7776	5.3470	15.4390	29.0021
2006	6.3999	0.8929	6.7540	11.6792	22.9541
2007	4.3468	1.1645	8.0610	10.7343	15.3845
2008	9.1498	1.3409	10.2690	16.4946	16.4920
2009	4.8445	1.2150	8.0460	19.2469	16.4318
2010	7.8997	1.6292	10.9220	10.7334	13.1002
2011	14.0471	2.4233	15.8380	8.7285	12.8100
2012	9.2928	2.3644	17.7630	11.1863	16.9677
2013	7.3125	2.4362	17.6000	11.6662	24.7718
2014	2.8562	2.5138	14.6000	15.4896	27.1977
2015	2.1208	2.5217	13.4650	17.1500	27.8359
2016	3.3735	2.4628	12.9200	17.4546	25.7126
2017	8.1289	2.5568	12.6470	12.3719	20.5938
2018	6.2001	2.8129	13.1340	7.8088	22.6493
2019	6.5078	2.9000	13.4110	7.1436	19.6644
2020	0.4144	2.8466	12.4290	9.8873	19.4925