International Trade and Private Sector Performance: A Critical Analysis of Ghana's Manufacturing Sector

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by

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Abstract

Private sector development has been recognised as the means to accelerate the rapid industrialization needed in developing countries. As such, the Government of Ghana since 1983 has instituted policies to make the private sector flourish and drive the country's economic prosperity. One of the key strategies employed by the government in the 1980s was the liberalization of trade through the Structural Adjustment and Economic Recovery Programmes. However, much is not known about how such policies have impacted on the performance of the private sector, especially in relation to trade in the African context. Even though empirical studies on trade liberalization and firm performance abound, there is however a paucity of research addressing only the private sector. Additionally, previous studies have often measured one indicator of firm performance, mostly, productivity. This study fills these gaps by analysing the effects of trade liberalization on the performance of the private sector in Ghana in a comprehensive way. In particular, the study investigates how import tariffs affect the profitability and productivity of private firms in Ghana's manufacturing sector. It also analyses the performance differences between importers vs. non-importers, and exporters vs. non-exporters as well as differences that accrue from foreign or domestic ownership of firms.

To investigate such relations, firm-level panel data, spanning 1991 to 2001 from the World Bank's Ghana Manufacturing Enterprise Survey together with documentary data from key ministries in Ghana were employed. The data was analysed using regression analysis in STATA 15. Firm-level productivity was estimated through a two-step estimation procedure. In the first step, the semi parametric approach of Levisohn Petrin was used in estimating the production function and the derivation of the Total Factor Productivity (TFP) in order to correct for the well-known simultaneity and selection biases. In the Second step, we examine the effect of tariff and other trade variables as well as firm characteristics on the derived TFP. On the other hand, profitability ratios of gross profit margin, net profit margin and gross profit per employee were employed in assessing the impact of trade on profitability.

The findings show that whereas lower tariffs are associated with improvement in productivity for fully or partially owned foreign firms, they are accompanied by a decline in productivity for fully owned Ghanaian firms. With respect to trade orientation, productivity of exporting firms was largely better relative to non-exporting firms, irrespective of the type of firm ownership. On the contrary, importing Ghanaian firms were mostly less productive compared to their non-importing counterparts, an indication that this study does not provide significant evidence in support of a learning by importing hypothesis. In terms of profitability, the results reveal an improvement for local firms as a result of a reduction in tariffs while no significant conclusion was reached in the case of foreign firms. In line with the productivity results, exporting firms were also observed to be largely profitable compared to both non-exporting and importing firms.

Dedication

I dedicate this thesis to my family, especially my husband, Dr. Erwin Alhassan and Emily, "meine kleine süße Maus".

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List of Acronyms and Abbreviations

AfDB	-	African Development Bank
CES	-	Constant Elasticity of Substitution
CEPII	-	Centre for Prospective Studies and International Information
CEPS	-	Customs, Exercise and Preventive Services
CPI	-	Consumer Price Index
CSAE	-	Centre for the Study of African Economies
CUSFTA	-	Canada United States Free Trade Agreement
DFID	-	Department for International Development
ECB	-	European Central Bank
ECOWAS	-	Economic Community of West African States
EPZ	-	Export Processing Zones
ERP	-	Economic Recovery Programme
E&W	-	Electricity and Water
FE	-	Free Entry
FP	-	Free Points
FTZ	-	Free Trade Zones
FZD	-	Free Zone Developers
FZE	-	Free Zones Enterprises
GATT	-	General Agreement on Tariffs and Trade
GDP	-	Gross Domestic Product
GFZ	-	Ghana Free Zones
GFZB	-	Ghana Free Zones Board
GH	-	Ghana
GIHOC	-	Ghana industrial Holding Corporation
GIPC	-	Ghana Investments Promotion Centre
GHS	-	Ghana Cedis
GMES	-	Ghana Manufacturing Enterprises Survey
GMM	-	Generalized Method of Moments
GOG	-	Government of Ghana
GPM	-	Gross Profit Margin
GPE	-	Gross Profit per Employee
GSS	-	Ghana Statistical Service
HS	-	Harmonized System

IDA	-	International Development Association
IEI	-	Inclusive Economic Institutions
ILO	-	International Labour Organization
IMF	-	International Monetary Fund
IPI	-	Inclusive Political Institutions
ISI	-	Import Substitution Industrialization
ISIC	-	International Standard Industrial Classification
IV	-	Instrumental Variables
MDG	-	Millennium Development Goals
M&Q	-	Mining and Quarrying
MDPI	-	Management Development and Productivity Institute
MFN	-	Most Favoured Nations
MP	-	Member of Parliament
MPSD	-	Ministry of Private Sector Development
MSMEs	-	Micro, Small and Medium Enterprises
MVA	-	Manufacturing Value Added
NBER	-	National Bureau of Economic Research
NGO	-	Non-Governmental Organization
NPM	-	Net Profit Margin
NTE	-	Non-Traditional Exports
OECD	-	Organization for Economic Co-operation and Development
ÖFSE	-	Austrian Foundation for Development Research
OLS	-	Ordinary Least Squares
OGL	-	Open General License
ONS	-	Office for National Statistics
PEF	-	Private Enterprises Foundation
PPP	-	Public Private Partnerships
PSAG	-	Private Sector Advisory Group
PSD	-	Private Sector Development
R&D	-	Research and Development
RPED	-	Regional Project on Enterprise Development
SAC	-	Structural Adjustment Credit
SAP	-	Structural Adjustment Programme
SDG	-	Sustainable Development Goals

Sida	-	Swedish International Development Cooperation Agency
SL	-	Specific License
SME	-	Small and Medium Enterprises
SOEs	-	State Owned Enterprises
SUL	-	Special Unnumbered License
TIP	-	Trade and Investment Programme
TIRP	-	Trade and Investment Reform Programme
TPR	-	Trade Policy Review
UK	-	United Kingdom
UN	-	United Nations
UNCTAD	-	United Nations Conference on Trade and Development
UNESCO	-	United Nations Educational, Scientific and Cultural Organization
USA	-	United States of America
USAID	-	United States Agency for International Development
VALCO	-	Volta Aluminium Company
VAT	-	Value Added Tax
WESO	-	World Employment and Social Outlook
WDI	-	World Development Indicators
ZCP	-	Zero Cut-off Profit

Table of Contents

Abstract i

Dedication ii

Acknowledgement iii

List of Acronyms and Abbreviations iv

List of Tables x

List of Figures xii

Description of Symbols xiii

1. INTRODUCTION 1

1.1 Concepts of Private Sector and Private Sector Development 3

1.2 Problem Statement 4

1.3 Outline of Chapters 8

2. STUDY BACKGROUND 11

2.1 Ghana's Industrialization Strategy after Independence 11

2.2 Trade Policies and External Trade Performance Prior to 1983 15

2.3 The Introduction of Economic Recovery and Structural Adjustment Programmes (1983 - 1989) 18

2.4 Economic Reforms and Progress (1990s - early 2000s) 25

2.5 The Ghanaian Manufacturing Sector 31

3. EVOLUTION AND RATIONALE FOR PRIVATE SECTOR DEVELOPMENT (PSD) .. 40

3.1 Evolution of Development Discourse on Private Sector Development 40

3.1.1 Structural Approach 40

3.1.2 Neoliberal Approach 42

3.1.3 Neo-structural Approach 43

3.2 Rationale for Private Sector Development 45

3.2.1 Economic Growth and Development via PSD 47

3.2.2 Innovation and Employment Generation through PSD 48

3.2.3 Poverty Reduction Effects of PSD 49

3.2.4 Efficiency and Domestic Revenue Mobilization from PSD 50

3.3 Contributions of the Private Sector in Ghana 51

4 THEORETICAL FRAMEWORK AND EMPIRICAL LITERATURE REVIEW 55

4.1 Arguments on Trade Liberalization 55

4.2 Channels of Gains to Domestic Firms via Trade 60

4.2.1 Competition Effect 60

4.2.2 Variety and Quality Effects 62

4.2.3 Learning Effect 63
4.3 Theoretical Framework 65
4.3.1 Theoretical Model of Productivity and Profitability Effects of Trade 66
4.3.1.1 Consumption and Production 67
4.3.1.2 Equilibrium in a Closed Economy 71
4.3.1.3 Equilibrium in an Open Economy 72
4.3.1.4 Impact of Trade 73
4.3.1.5 Impact of Trade Liberalization 75
4.3.2 Model Implications for Empirical Results 76
4.3.3 Empirical Studies on the Productivity Effects of Trade 77
4.3.4 Empirical Evidence of the Profitability Effects of Trade 81
5 DATA 85
5.1 Description of Data 85
5.2 Sources of Documentary Information 92
5.3 Existing Empirical Research from the Dataset and how the Current Study Differs 93
5.4 Data Cleaning and Testing 102
5.5 Limitations of the Data 103
6 MEASURING FIRM PERFORMANCE AND DESCRIPTION OF VARIABLES 104
6.1 Performance Measurement 104
6.1.1 Measurement of Total Factor Productivity 104
6.1.2 Measurement of Profitability 106
6.2 Operationalization of Variables 108
6.3 Descriptive Statistics 113
7 ESTIMATION OF ECONOMETRIC MODELS 116
7.1 Empirical Model and Estimation of Productivity Effects of Trade 116
7.2 Empirical Model and Estimation of Profitability Effects of Trade 124
8 RESULTS AND DISCUSSIONS 128
8.1 Production Function and Benchmark Results 128
8.1.1 Tariff-Productivity Nexus Based on Firm Characteristics 134
8.1.2 Alternative Measures of Productivity 140
8.2 Profitability Effects of Trade 144
8.2.1 Benchmark Results 144
8.2.2 Firm Characteristics and Profitability 154
8.2.3 Tariff - Profitability Analysis using System GMM Estimator 157
8.3 Synthesis of Research Questions and Findings 162

9 CONCLUSIONS AND POLICY IMPLICATIONS 166
9.1 Summary of Study Conclusions 166
9.2 Study Findings and Policy Implications 169
BIBLIOGRAPHY 178
Appendix A: Appendix to Chapter 2. 199
Table A.1: Tax Rebates for Manufacturing Sector in Ghana. 199
Table A.2: Establishments and Persons Engaged in Manufacturing in Ghana by Region. 199
Appendix B: Appendix to Chapter 5 199
Table B.1: Firm Classification into Subsectors Based on ISIC (Rev. 2). 199
Table B.2: Unit Root Test of Key Variables. 200
Appendix C: Appendix to Chapter 6. 200
Appendix C.1: The Inverse Hyperbolic Sine Transformation Proposed by Johnson (1949). 200
Appendix D: Appendix to Chapter 7. 200
Appendix D.1: Production Function Estimation using the Methodology of Levinsohn and Petrin (2003). 200
Table D.2: Hausman Test for Fixed or Random Effects. 202
Appendix E: Appendix to Chapter 8. 203
Table E.1: Tariffs and Productivity, Lags for Ghanaian Importing Firms: System GMM Estimation. 203
Table E.2: Tariffs and GPM: System GMM Estimation. 204
Declaration 208

List of Tables

Table 2.1: Export Data for Ghana's Non-Traditional Exports (NTEs) from 1970 to 1990. 17
Table 2.2: Before and After ERP Analysis of Key Macroeconomic Indicators. 22
Table 2.3: Persons Engaged in Manufacturing by Size, Ownership, Legal Organization and Skills in Ghana, 2003. 35
Table 2.4: A Comparison of Establishment and Persons Engaged in Industry (1987 and 2003) in Ghana. 37
Table 2.5: Manufacturing Establishments by Size, Employees and Wages/Salaries, 2003, Ghana. 37
Table 3.1: Persons Engaged by Industry Major Division and Type of Ownership, 2003. 52
Table 3.2: Average Monthly Earnings per Employee (Government and Private), December 2000 - 2002. 53
Table 5.1: Average Output Tariffs (1991 – 2001), Ghana. 85
Table 5.2: Composition of Data. 87
Table 5.3: Empirical Studies from RPED, GMES Dataset. 95
Table 6.1: Performance Indicators and Dependent Variables. 108
Table 6.2: Description of Variables for the Production Function. 109
Table 6.3: Description of Explanatory Variables and their Expected Signs on the Performance Indicators 111
Table 6.4: Summary Statistics. 113
Table 7.1: Comparison of Variables used as Proxy for Productivity Based on the Ghanaian Manufacturing Dataset. 120
Table 8.1: Levinsohn Petrin Production Function Estimates by Sub-Sector. 129
Table 8.2: Tariffs and Firm-Level Productivity (All Firms) – Fixed Effects Estimation. 129
Table 8.3: Tariffs and Firm-Level Productivity – Fixed Effects Estimation. 131
Table 8.4: Tariffs and Firm-Level Productivity - System GMM Estimation. 133
Table 8.5: Tariffs and Firm-Level Productivity Based on Firm Ownership. 134
Table 8.6: Tariffs and Firm-Level Productivity of Ghanaian Importing Firms. 136
Table 8.7: Tariffs and Firm-Level Productivity of Ghanaian Firms Based on Size. 137
Table 8.8: Average Total Factor Productivity of Fully Owned Ghanaian Firms Based on Trade Orientation. 139
Table 8.9: Tariffs and Firm-Level Productivity using Indirect Materials Cost as Proxy: Fixed Effects Estimation. 141
Table 8.10: Tariffs and Firm-Level Productivity using Indirect Materials Cost as Proxy: System-GMM Estimation. 143
Table 8.11: Breakdown of Number of Observations by Profit Sign. 144
Table 8.12: Gross Output, Real Materials Import and Gross Profit, 1991 – 2002. 145
Table 8.13: Tariffs and Firm-Level Profitability – Baseline Results (All Firms). 147
Table 8.14: Tariffs and Firm-Level Profitability (Gross Profit Margin). 149
Table 8.15: Tariffs and Firm-Level Profitability (Net Profit Margin). 151
Table 8.16: Tariffs and Firm-Level Profitability (Gross Profit per Employee). 153
Table 8.17: A Comparison of Output and Gross Profit between Importers and Non-Importers (million Ghana cedis) 154
Table 8.18: Gross Output, RMI and Gross Profit by Sub-Sector (million Ghana cedis). 155
Table 8.19: Average Net Profit Margin Based on Trade Orientation. 155
Table 8.20: Tariffs and Firm-Level Profitability Based on Firm Ownership. 156

Table 8.21: Firm Size and Profitability (NPM) of Ghanaian Firms. 157
Table 8.22: Tariffs and Firm Profitability (Net Profit Margin) for All Firms: System GMM Estimation. 159
Table 8.23: Tariffs and NPM: System GMM Estimation. 161

List of Figures

Figure 2.1: Contribution Trend of Trade in Percentage of GDP Prior to the Introduction of the ERP (1960 to 1982) in Ghana. 18
Figure 2.2: Contribution of Trade to Growth (Pre- and Post-ERP) showing Trade, Imports and Exports as a Percentage of GDP from 1970 to 2002. 24
Figure 2.3: Ghana's Most Favoured Nation Simple Mean Tariffs for Manufactured Products and for All Products, 1993 – 2002. 27
Figure 2.4: Ghana's Total Merchandized Trade, by Value in Current (US$ m) from 1991 to 2002 27
Figure 2.5: A Comparison of GDP Growth (Annual Percentages) between Ghana, Low Income Countries, Lower Middle-Income Countries and Sub-Saharan Africa for the Period 1990 – 2002 28
Figure 2.6: Distribution of Establishments in Ghana's Industry: A Comparison of 1987 and 2003 32
Figure 2.7: Persons Engaged by Type of Ownership in Ghana's Manufacturing (2003) 34
Figure 2.8: Contribution of Ghana's Manufacturing to Growth in Percentage of GDP, 1984–2002 38
Figure 2.9: Ghana's Manufacturing Contribution to Merchandised Trade (1991 – 2002) 39
Figure 3.1: What Private Sector Development Offers. 46
Figure 3.2: Investment and Growth in Developing Countries, 1990 – 1998. 48
Figure 3.3: Persons Engaged by Type of Ownership of Establishment in Ghana's Industry (2003). 52
Figure 3.4: Private and Public-Sector Share of Employment in Ghana (1992 – 2000). 53
Figure 4.1: Determination of the Equilibrium Cutoff and Average Profit. 71
Figure 4.2: The Reallocation of Market Shares and Profits 75
Figure 5.1: Employment Share by Sub-Sector (1991 – 2001). 89
Figure 5.2: Total Employment in Manufacturing over the Period (1991 – 2001). 89
Figure 5.3: Annual Real Manufacturing Value Added for All Firms (1991 – 2001). 90
Figure 5.4: Manufacturing Real Annual Wages in Ghana (1991 – 2001). 91
Figure 6.1: Manufacturing Output Exported Outside and Within Africa from Ghana in Percentages (1993 – 2001). 114
Figure 6.2: Manufacturing Output Exported Outside and Within Africa from Ghana in Percentages (1993 – 2001) by Sector 115
Figure 8.1: Average Tariffs and TFP of Ghanaian Firms by Sub-Sector. 138
Figure 8.2: Gross Output, Real Materials Import and Gross Profit of Fully Owned Ghanaian Firms, 1991 – 2001. 146
Figure 9.1: Positioning Strategies for Emerging Economies. 174

Description of Symbols

Symbol	Description
$\hat{\beta}_k$	Elasticity of capital
$\hat{\beta}_l$	Elasticity of labour
$\hat{\beta}_m$	Elasticity of materials
$\tilde{\varphi}_a$	Average productivity level in autarky
$\tilde{\varphi}_x$	Average firm productivity level for exporting firms
M_l	Log real material cost
R_l	Log real gross output
T_p	Tariff paid
p_{in}	Probability of successful entry
$\bar{r}$	Average firm revenue
r_d'	Domestic revenue at the new equilibrium
u^q	Unexpected deviations from the mean due to measurement errors and other external factors
v_e	Net value of a firm at the free level of entry
α_1	Coefficient of the tariff variable in the productivity analysis
θ_1	The coefficient of the tariff variable in the profitability analysis
$\bar{\pi}$	Average profit level
$\bar{\pi}$	Average firm profit
τ'	Trade cost in the new equilibrium
$\tilde{\varphi}$	Average firm productivity level/weighted average firm productivity
φ^*	Cutoff productivity level
$\varphi^{*\prime}$	Productivity cut-off level at the new equilibrium
φ_a^*	Cutoff productivity level in autarky
φ_x^*	Cutoff productivity level for exporting firms
$\varphi_x^{*\prime}$	New export productivity cut-off level
$\widehat{\omega}$	Total Factor Productivity
$\prod$	Aggregate profit
A	Efficiency level of a firm
a	autarky
C_t	Control variables/firm specific characteristics for the profitability model
d	domestic
F	Mass of firms
f	Fixed cost
f_e	Investment cost

f_x	Fixed export market entry cost
i	Firm
I	Log real indirect cost (electricity, transport etc.)
j	Sector
K	Real capital
k	Log of real capital
L	Labour
l	Labour
L_a	Aggregate level of labour
l	Log of labour
ln GPE	Log Gross Profit per Employee
ln GPM	Log Gross Profit Margin
ln NPM	Log Net Profit Margin
ln TFP	Log Total Factor Productivity
ln TFPl	Log Total Factor Productivity of Ghanaian firms
M	Real materials
m	Log of real materials
n	The mass of varieties produced
NE	Number of employees
NI	Net income
P	Aggregate price
Q	Aggregate output
q	Firm output
R	Aggregate revenue or expenditure
r	Revenue of a firm
r_d	Domestic revenue
r_x	Export sales
t	Time (year)
T	Average bilateral tariff rates
U	Utility function
u	Error term of the profitability model
W	Log real wages
w	Common wage rate
X	Firm characteristics for the productivity model
Y	Real gross output
y	Log of real gross output

z	Parameter to be transformed
α	Coefficients of the productivity model
β	Coefficients of the production function to be determined
β_k	Coefficient of log capital
β_l	Coefficient of log labour
β_m	Coefficient of log materials
δ	Constant probability of death/exit
ε	Time varying error
θ	Coefficients of the profitability model to be estimated
θ_0	The intercept of the profitability model
Δ	Change
ν	Net value of a firm
π	Profit of a firm
ρ	Firm price
σ	Constant elasticity
τ	Trade cost
$\bar{\upsilon}$	Present value of average profit flows
φ	Productivity level
Ω	Mass of available goods
$G(\varphi^*)$	Continuous cumulative distribution at the cutoff productivity level
$g(\varphi)$	Common distribution
$\mu(\varphi)$	Distribution of productivity levels
ω	Variety of goods

1. INTRODUCTION

The private sector provides about 90% of jobs and accounts for 84% of the Gross Domestic Product (GDP) in developing countries (European Commission Communication, 2014). In Africa, it contributes over 80% to total production, as well as two-thirds of total investment and employs about 90% of the working age population (AfDB, African Development Report, 2011). It is therefore very essential in fighting poverty, thereby improving the lives of the poor and ensuring inclusive growth (European Commission Communication, 2014; DFID, 2008; OECD, 2007). The development of the private sector therefore plays an important role in the development process by generating employment, providing better wages/income, generating public revenue, reducing poverty and improving living conditions. The private sector also serves as an engine for innovation, competition, growth, investment and prosperity (Cain, 2014; OECD, 2007). Furthermore, private sector development encourages and promotes entrepreneurship and economic diversification.

Nonetheless, the private sector can play its crucial role as an engine of economic growth in developing countries if a conducive and enabling business environment exists. To this end, trade policies are especially needed to boost the contribution of the private sector to economic development. These policies incentivize players in the private sector to invest, withstand foreign competition in domestic markets and engage in international markets. The trade engagements with other countries then allow for new technologies to be introduced as well as ensuring more competitive working systems (European Commission, 2010). Furthermore, trade policies targeted at the private sector lead to the diversification of developing economies that are either overly dependent on the exports of a few non-traditional exports or export to a few international markets. Consequently, these economies become more resilient. Then again, trade policies in the form of tariff reductions and elimination of non-tariff barriers to trade results in the reallocation of resources, changes in firm profits (Melitz, 2003) and outputs as well as wages and employment levels.

Even more important to the development contributions of the private sector is the manufacturing sector, which is deemed as the means to the rapid modernization and industrialization of developing countries. It is said to be the "most dynamic part of an industrial sector" (Weiss, 2002:2), a source of numerous positive spillovers, and skilled job creation (Tybout, 2000). Moreover, it is expected that high returns are generated in the manufacturing sector. Thus, rapid growth in manufacturing is associated with fast growing economies whilst

slow manufacturing growth tend to be the case in slow growing economies (Weiss, 2002). In view of this, the sector is often given prominence in development strategies, particularly in relation to private sector engagements in the manufacturing sector.

Despite the contributions of the private sector, it was not favoured by several African countries at independence and Ghana is no different. Instead, state-led development characterized by State-owned Enterprises (SOEs) backed by import substitution strategies dominated the economy. However, such state backed closed economies proved to be unsustainable (AfDB African Development Report, 2011). Consequently, there was a shift to private sector led development in the early 1980s through structural reforms spearheaded and sponsored by the Bretton Woods institutions. This is a clear example of the path Ghana pursued after independence. Not only was the Ghanaian private sector marginalized, but it also had a weak manufacturing sector due to its high dependence on manufactured products from its colonial masters. On the backdrop that "development is associated with structural transformation" [1] (Jedwab and Osei, 2012:1), structural reforms were thus the obvious option in order to chart a sustainable growth path for the country. Indeed, Ghana was one of the early reformers in the sub-region. Hence, its once neglected private sector took center stage with the introduction of the Economic Recovery and Structural Adjustments Programmes (ERP and SAP respectively) that sought to promote manufacturing industries and an outward looking economy backed by the private sector. However, questions of whether trade liberalization has delivered the expected benefits remain unanswered. In fact, Buffie (2001:3) posits that studies on trade policy in less developed countries abound on advocacy and assertion "but distressingly short on clean analytical and empirical results". It is for this reason that this thesis seeks to analyze the effects of Ghana's trade liberalization on the productivity and profitability of private firms in Ghana's manufacturing sector using firm level data. It specifically examines the extent to which tariff reductions have contributed either to an increase or decrease in the productivity and profitability of private manufacturing firms between 1991 and 2001. In addition, it investigates the performance differences between firms engaged in import or export activities. Finally, it analyses whether firm ownership type (i.e. foreign or domestic) play a significant role in delivering superior firm performance.

[1]Structural transformation is defined as a transformation from one sector to another, usually from a sector with low labour productivity to a higher one.

1.1 Concepts of Private Sector and Private Sector Development

The term private sector has been broadly defined by the OECD (2004:17) as "a basic organizing principle of economic activity where ownership is an important factor, where markets and competition drive production and where private initiative and risk-taking set activities in motion". Thus, the term encompasses all private actors, be it poor or rich, individuals and businesses that undertake risky activities in order to make profits and income via market exchange. It does apply also to multinational corporations as well as smallholder farmers (OECD, 2004). Similarly, Di Bella et al. (2013: 9) also defined private sector as "Organizations that have a core strategy and mission to engage in profit-seeking activities through the production of goods, provision of services, and/or commercialization. Includes financial institutions and intermediaries, micro, small, and medium-sized enterprises, individual entrepreneurs, farmers, co-operatives, and large corporations operating in the formal and informal sectors".

From the foregoing, the private sector is simply made up of individuals and or organizations engaged in rent seeking activities that relies on governments or states to create an enabling business environment for their successful operations. As a result, interdependence between the private sector and state/government is created since governments need the private sector to complement its efforts in the creation of jobs, revenue generation, provision of infrastructure and other services to its citizenry.

Di Bella et al. (2013) opine that the roles and activities carried out by the private sector in their business operations that affect development outcomes and economic growth is termed as private sector in development. Although the concept of private sector development existed since time immemorial, it is only recently that Di Bella et al. (2013:9) offered a formal definition of the concept as: "Activities carried out by governments and development organizations geared toward creating an enabling environment for business to flourish. Includes activities by development cooperation actors aimed at increasing private sector investment in developing countries". A prior understanding of the concept in line with their definition states that: "Private sector development is the interplay between the state as formulator of the rules of the game, players in the private sector and civil society" (Sida, 2004: 4). Based on this, different types of market players, be it formal or informal sector, multinational or domestic companies irrespective of size are included in the sector. It also encompasses all sectors of the economy including trade, infrastructure and social services

(Sida, 2004). Consequently, it is seen as an approach instead of the traditional meaning of a sector.

Four fundamental elements are said to underpin the development of the private sector and the absence or neglect of any of these would limit such a development. These are: competitive markets, entrepreneurship, property rights, and decent work conditions (Sida, 2004). A competitive market, where a level playing field exists sets the stage for a prosperous private sector. Hence, the rules of the game must be clear to all. Also, property rights that are fair and non-discriminatory are a prerequisite for the development of the private sector. Above all, entrepreneurship is important since it serves as a source of innovation and change. To put it differently, people should be willing to take up the risks and challenges associated with entrepreneurship and are expected to consistently generate new ideas irrespective of the costs and benefits. For a productive labour force, decent working conditions must also be in place. Finally, all these elements must be backed by a legal framework that addresses the challenges and disputes arising thereof. This ensures that all players are treated fairly.

It is clear from the definitions that the agenda for private sector development is being pushed forward by two main actors: government and development organizations (donor agencies). This thesis, however, has its focus on the role of the government in the development of the private sector. Government's involvement in the private sector is rooted in the debate that the private sector is the engine of growth and the driving force for industrialization and modernization desired by developing countries. It is therefore not surprising that private sector involvement in the manufacturing sector has become a key pillar in the national development strategies of most developing countries (particularly in Africa) in recent years.

1.2 Problem Statement

Most African countries including Ghana adopted trade liberalization as a means to industrialization but there are concerns as to whether that is the best development strategy for developing countries. Indeed, the words of Weisbrot and Baker (2003:16), that "it is not clear that trade liberalization is the key to rapid growth and development" clearly alludes to that. In fact, they assert that trade liberalization can result in worse outcomes for developing countries. Indeed, some critics of the World Bank argue that the trade liberalization programmes backed by the World Bank has rather caused de-industrialization in Sub-Saharan Africa (Saha, 1991). These criticisms and concerns stem from doubts about the effectiveness of trade liberalization in developing countries based on the following reasons: 1) domestic industry collapses; 2)

revenue losses to government; and 3) huge costs of such interventions (that relating to market failures). It is argued that undue foreign competition drives local firms out of business as they are unable to compete with their foreign counterparts (Gashgari, 2016). Hence, without protection via tariff and non-tariff barriers, domestic firms in developing countries cannot withstand competition from their foreign counterparts. The absence of such protection as a result of trade liberalization thus squeezes domestic firm profitability, which inhibits their investment in cost reducing capital and technology (Slaughter, 2004). Consequently, thousands of jobs are lost due to the non-profitability and eventual collapse of such domestic firms (Gashgari, 2016). In fact, Saha (1991:2759) opines that dismantling import controls in Africa led to "massive redundancies in the formal manufacturing sector". Also, tariffs are said to be a major source of revenue to governments of developing countries, the removal of which causes revenue loses to the state (Weisbrot and Baker, 2003), and handicaps it in its effort to provide infrastructure to its citizenry. These losses are said to be larger than the gains accrued from such policies (Weisbrot and Baker, 2003). For instance, in Ghana food subsidies were removed as part of IMF backed adjustment programmes (Saha, 1991), which was probably meant to ease the burden on government due to decreases in tariff revenue emanating from declining tariffs as a result of reducing import controls. It is therefore believed that liberalization policies sponsored by the World Bank "had traumatic results on the poverty situation" in Africa (Saha, 1991:2760).

A major concern and controversy with regards to liberalizing trade is market failures and its associated cost. Harvey (2005) opines that market failure arises as a result of individuals and firms avoiding paying the full costs that are attributable to them, and rather shed such liabilities outside the market, thus requiring some intervention from the state. However, it is asserted that the costs incurred through government interventions meant to overcome the challenges of market failures are much higher than that associated with market failures (Reiner and Staritz, 2013; Herbst, 1993). For instance, Herbst (1993:104) notes that "governments in countries like Ghana have persuasively demonstrated just how costly government intervention in the economy can be". As such some neoliberals have argued that inaction by government in the case of market failures is preferred because they believe that the "cure will almost certainly be worse than the disease" (Harvey, 2005:67).

Contrary to the above claims, the Asian tigers flourished via opening up. Moreover, the Import Substitution Industrialization (ISI) strategy adopted by developing countries had very limited success (Steel, 1972; World Bank, 1985). For instance, Steel (1972) asserts that the import

licensing system contributed to inefficiencies in the manufacturing sector due to high production costs. So, the proponents of free trade argue that the benefits of opening up far outweigh the associated costs especially for developing countries (Corden, 1967; Matusz and Tarr, 1999; Dollar, 2001; Love and Lattimore, 2009). This makes the debates on the best strategy or path to industrialization inconclusive especially in the African context.

Ghana has adopted different strategies to its development since independence. With an initial closed economy backed by ISI and state enterprises, performance of the domestic manufacturing sector was constrained by the lack of imported raw materials and inputs (MDPI, 1974; Nyanteng, 1980). This emanated from the import licensing system and exchange rate controls. After that there was a transition to an open economy in 1983 via trade liberalization with an emphasis on the manufacturing sector and the recognition of the private sector as the engine of growth. A liberalized trade regime has been in place since 1990 but as of 2001, manufacturing contributed only about 10% to Ghana's GDP (TPR, 2001) and has since reduced to about 4.9% in 2014 (GSS, 2015).

On the other hand, government revenue through the ERP rose from just 5% of GDP in 1983 to 14% in 1986, improving the fiscal position of the government. Merchandized exports and imports witnessed substantial expansions from 18% and 29% in 1993 to 28% and 39% of GDP in 1998 respectively (TPR, 2001). Thus, to what extent can trade liberalization be said to have contributed to such increase/growth? Also, there have been calls for "continued structural reforms including further trade and investment liberalization," as a means to "improve the economy's flexibility and growth prospects" (TPR, 2001: xiii). This study will provide evidence either in favour or against such calls.

Although studies on trade and firm performance are expansive, several of them in the past have been inclined to the public sector and not so much on the private sector and a few others have also focused on research at the industry level (Fatou and Choi, 2013; Bigsten and Gebreeyesus, 2009; Amiti and Konings, 2007; Bigsten et al., 2004). In addition, most studies have been at cross-country level (Bresnahan et al., 2016; Nyantakyi and Munemo, 2014; Foster-McGregor et al., 2016; Saliola and Seker, 2011; Söderbom et al., 2006; Van Biesebroeck, 2005; Söderbom and Teal, 2001; Bigsten et al., 1999b; Bigsten et al., 1998) and asserted by Bruhn (2011) as unable to provide more reliable causal relationship due to other country characteristics that are hard to control for but can be accounted for by within country studies as carried out in the

current study. Aside the focus on cross-country studies, there is a paucity of empirical research of within country studies in developing countries as purported by Zee et al. (2002).

Then again, several studies on trade have made use of country level data (macro-level), that is said to be not sufficiently informative as trade is said to be undertaken by firms but not countries (Hallak and Levinsohn, 2008). These studies, numbering about 162 globally since 1972 have been deemed to be addressing big questions and not the smaller questions needed to make progress in this study area. As such, the authors posit that "country level data are not granular enough to capture how trade impacts firms and households around the globe" (Hallak and Levinsohn, 2008:217). Such aggregate data in the views of Kasahara and Rodrigue (2008) does not allow for the capturing of the heterogeneity across different firms in an economy. Thus, it is necessary to first examine changes at the firm level as done in the present study in order to have a better understanding of changes on the aggregate level.

Another gap in the literature is the focus on one measure of firm performance – productivity when studying such effects of trade on firm performance. Currently, the number of studies with a focus on profitability as a measure of firm performance is still small, with an even smaller number of countries that are all member states of the European Union (Wagner, 2012). So far only a few studies have looked at the link between trade and profitability, especially in relation to tariffs. Thus, it is believed that firm level analysis of the trade profitability nexus has not been well documented especially in the case of newly industrialized and developing countries (Srithanpong, 2014). Much research in this area is therefore needed especially from the perspective of African countries.

This thesis fills the above gaps by adopting an approach that analyses the effects of trade liberalization on firm performance in a comprehensive way. Specifically, the study measures not only one performance indicator as done in many studies but two major dimensions of performance as productivity and profitability, the first of its kind to the best knowledge of the author in the African context. Also, firm level data was employed, thereby answering the necessary 'smaller' questions needed for progress as suggested by Hallak and Levinsohn (2008). Then again, the study assesses performance of private firms that are deemed to cause the rapid development of a country as against that of public enterprises. Finally, this study is a within country study carried out in the developing country of Ghana, which has witnessed long term trade liberalization since the 1980s and has maintained a credible commitment to trade reforms over the years. There is also a mid-run firm-level panel data, consisting of twelve years

of data for Ghana's manufacturing sector, that is suitable for assessing the impacts of trade reforms on firm performance in the country. Amid the continuous calls for liberalization in the developing world, the outcome of this study is useful to policy makers in their trade policies especially with regards to either increasing or decreasing tariffs. The study therefore does add to knowledge in the framework of developing country studies in the area of trade and firm efficiency.

Following the above, this research seeks to answer the main question of: To what extent has trade liberalization contributed to private sector performance in Ghana? Specifically, the study seeks to answer two key questions as follows:

1) Do tariff reductions result in high firm-level productivity and profitability in Ghana?
2) Are there performance differences among firms based on trade orientation, size and firm ownership?

Based on the above research questions, the specific objectives of the study are:

- To explain the relationship between import tariff reductions and firm productivity and profitability
- Determine if importers and exporters have superior performance than firms not engaged in international trade.
- Investigate performance differences between foreign and domestic firms as well as among small and large firms.

To answer the questions raised in this study, firm-level panel data spanning from 1991 - 2001 from Ghana's Manufacturing sector are analyzed. The data was collected by the Centre for the Study of African Economies (CSAE) at Oxford University, University of Ghana, Legon, and the Ghana Statistical Service (GSS) and made available by CSAE. Other secondary data was gathered through documentary research to augment the CSAE dataset.

1.3 Outline of Chapters

The rest of the chapters are structured as follows: The next section gives a brief overview of the policy context and content (background) starting with Ghana's industrialization strategies after independence. It then continues with the trade policy strategies before 1983 as well as that of the ERP and SAP together with their outcomes. Then after, economic reforms and progress

since 1990 are discussed and concludes with a description of the Ghanaian manufacturing sector. Section 3 presents the evolution and rationale of private sector development. It looks at key issues of the role of the private sector to development and the debates on the best development strategies that have evolved over time. These debates have centered on three key approaches beginning with the structural approach where state enterprises and state control was key to development. On the other hand, proponents of a neoliberal approach argue that selective interventions are not needed. Nevertheless, it has become increasingly clear that the path to modernization and industrialization for developing countries is via the private sector. Thus, the third approach termed the neo-structuralist approach focuses on the transformation from agriculturally based economy to an industrial sector with the private sector at the center of development that can only succeed with key policy roles of government.

In section 4, the theoretical framework that forms the foundations for the empirical models in Chapter 7 are discussed. The section begins with arguments on trade liberalization which clearly has two opposing thoughts. On the one hand, arguments put forth in favour of trade liberalization relate to the infant industry argument, protection against dumping and the self-reliance of developing countries. On the other hand, the opposing proponents have argued that trade liberalization is needed for the growth of developing countries via increased domestic competition, easy access to better technologies, inputs and intermediate goods, specialization and economies of scale benefits. This chapter further discusses the channels of gains to firms engaged in international trade. One strand of the literature argues that increased competition due to international trade results in innovation and efficiency – referred to as the competition effect. Another strand asserts that gains to domestic firms accrue via access to a variety of inputs and products, known as the variety effect. Yet another strand, termed as the quality effect posits that firms benefit from international trade through access to quality intermediate inputs that are inaccessible in autarky. The final strand relates to a learning effect whereby domestic firms learn from the use of advanced technology. The model developed by Melitz (2003) forms the theory underlying the productivity and profitability analysis in this thesis. The model postulates that increased exposure to trade causes the least productive firms to exit the market whereas the more productive firms stay and enter into the export market. As such, the more productive firms produce more and therefore earn more revenues and higher profits. This makes it a perfect choice for this thesis because it addresses both productivity and profitability effects of trade. Also, unlike other trade models (Krugman, 1980) that treat firms as homogenous, the Melitz model allows for firm heterogeneity. In other words, it assumes that

firms within the same sector are not identical in terms of their productivity and profitability. The chapter concludes by presenting a survey of empirical studies that relates to productivity and profitability effects of international trade. In particular, the survey reveals the paucity of research with regards to the trade-profitability relationship.

Section 5 describes the data employed and presents a list of empirical studies that have used the same dataset as employed in the current thesis. It identifies the deficiencies of these previous studies and then highlights the contributions of the current thesis and how it differs from the previous studies. After which, the measurement of the performance indicators is presented in section 6. The empirical models are then outlined in section 7, starting with the productivity model. The empirical productivity model begins with the estimation of the production function using the Levinsohn-Petrin (2003) approach. Its advantages are that it uses intermediate inputs as proxy for unobserved productivity, thereby preventing the loss of a larger number of observations in the study since most firms often record annual values for intermediate inputs unlike investments that are often zero or missing. Additionally, the Levinsohn-Petrin (LP) method solves endogeneity and selection biases inherent in the dataset. Total Factor Productivity (TFP) is modelled on the gross-output approach since it measures the true picture of productivity improvement. Profitability on the other hand is determined via profitability ratios of Gross Profit Margin (GPM), Net Profit Margin (NPM) and Gross Profit per Employee (GPE). For robustness of results, Fixed Effects (FE) and System Generalized Method of Moments (GMM) methods were used in the productivity and profitability analysis. The regression results are presented and discussed in section 8 whilst section 9 presents the conclusions and policy implications.

Generally, the results show that the productivity of local firms do not improve with falling tariffs. In contrast, fully or partially owned foreign firms are observed to benefit positively from declining tariffs in terms of their productivity. This suggests that the presence of foreign competition in Ghana due to trade liberalization threatens the survival of fully owned Ghanaian firms in the manufacturing sector. In terms of profitability however, the findings reveal that local firms are profitable when tariffs decline. Furthermore, exporting firms were generally observed to be mostly productive and profitable as compared to their non-exporting counterparts, calling for the need to adopt an export-led strategy of development in Ghana as export performance is central to growth and firm survival.

2. STUDY BACKGROUND

African countries have adopted different strategies to development since independence with the main goals to industrialize and become developed nations. At independence in 1957, Ghana inherited an underdeveloped industrial sector that was highly dominated by the domestic manufacturing sector which contributed very little to the country's economic growth. This was mainly due to the focus on raw material extraction by the British, Ghana's colonial leaders coupled with a dependence on manufactured products from Britain (Ackah et al., 2014). Other reasons as Killick (2010:48) notes were the orientation of the economy towards raw materials exports using cheap labour, which was deprived of industries and modern know-how as well as serving as a "dumping ground for the surplus of manufactured goods of the industrial nations", whilst being "exploited both in the prices received for exports and in those paid for imports, and the excessive dependence on trade with the metropolitan power". Also, the influx of goods from Europe at the time displaced indigenous industries (Clark, 1995). Indeed, Stein (2000:18) asserts that "colonialism in Africa impeded the expansion of indigenous private sectors".

Consequently, Ghana's first President Dr. Kwame Nkrumah in a bid to build a modern nation-state as well as attain economic independence pursued a 'big push' to industrialization to break out of underdevelopment and achieve a critical minimum of self-sustaining growth (Ray, 1986). According to Clark (1995), Nkrumah used revenues from cocoa sales as security to take loans to establish industries for the production of import substitutes and for products for exports. It is asserted that the drive for development at this time was at its strongest with the most ambitious policies (Killick, 2010) that were grounded in the desire to reduce Ghana's vulnerability to world trade (Clark, 1995: 135). Indeed, Nkrumah's desire was to move Ghana from a predominantly agricultural economy to an industrial one. These were in line with the thinking of economists in the sixties that development entails industrialization. In other words, growth that is not driven by industrialization is believed to be unsustainable in the long-term. In this chapter, we highlight Ghana's strategies to development since independence with an emphasis on trade policies between the 1980s and early 2000s that affect manufacturing and private sector firms. The section concludes with a brief description of the Ghanaian manufacturing sector.

2.1 Ghana's Industrialization Strategy after Independence

Initially, Ghana's industrialization agenda was to be attained through the efforts of both private and state enterprises. Owing to this, measures were taken to promote Ghanaian entrepreneurs

with a committee tasked in 1958 to assess how best business challenges could be overcome by Ghanaian enterprises. Additionally, publicly owned enterprises were established with the aim of transferring them over to private hands when they had become viable (Killick, 2010). This strategy was probably motivated by William Arthur Lewis, who was an economic advisor to Nkrumah. Lewis (1953) believed that domestic entrepreneurs lacked the necessary experience and therefore advocated that the state plays an important role of setting up industries it thought would be successful that could later be transferred to the private sector once they were successfully established. However, the private sector fell out with the government as early as 1960 when Nkrumah declared his strategy to focus on and promote state enterprises as the means to industrialization. In Nkrumah's own words, "the domestic policy of my government is the complete ownership of the economy by the state…" (Killick, 2010:42). Therefore, the public sector was favoured over the private sector, and state-owned enterprises expanded, reaching about 280 enterprises by 1980 (Brownbridge et al., 2000). This preference also meant that the public sector had much easier access to finance and foreign exchange than the private sector.

To this end, the publicly owned enterprises established by the industrial development corporation were never transferred to private entrepreneurs, instead private Ghanaian enterprises were to develop on their own (Ghanaian Times, 1960). Some small manufacturers were even nationalized in 1979 (Brownbridge et al., 2000). Indeed, Stein (2000:18) opines that "The state in post-colonial Africa was instinctively opposed to private sector development and did not recognize the private sector as a crucial development player." It is also asserted that Nkrumah preferred foreign investors whom he had no love for than to encourage local entrepreneurship. Thus, his CPP government "starved the private sector of imported raw materials, spares and equipment" (Killick, 2010:42). Hence, this period saw the crowding out of the private sector due to the dominance of the public enterprises and the lack of incentive for private investments. The private sector was neglected for reasons that can be attributed to the following 3 key factors: 1) inability to cause industrialization: domestic private entrepreneurs were deemed to have inadequate capital and the know-how to lead the industrialization of the country at the speed Nkrumah wanted. Indeed, Lewis (1953) argued that entrepreneurs lacked experience and therefore the state should take the lead in pioneering industries. The neglect of the private sector could also generally be attributed to the fact that there was a "paucity of viable private sectors in many countries in the early stages of post-colonialism" that required that states fill the vacuum as noted by Stein (2000:11); 2) Political

power: Nkrumah believed that encouraging a domestic private sector meant making some families/businessmen wealthy and too powerful, which he thought could pose a threat to his political power (West Africa, 1966); and 3) Ideology: Nkrumah was of the view that promoting Ghanaian private capitalism will hamper the advancement of his socialism ideology, which he sought to use to transform the economy via the rapid development of state and cooperative sectors (National Assembly Debates, 1964). Consequently, enterprises established and operated by government were recognized as the sure way to prosperity. Therefore, Nkrumah adopted a centrally planned economy driven by state enterprises and backed by import substitution strategies which was also meant to reduce overdependence on colonial powers and foreign products. He justified his state enterprises strategy with the argument that there were no alternatives if industrialization was to proceed because the indigenous private enterprises in his view could not do it alone and leaving it to foreign investors meant that the country will be left at the mercy of neo-colonialist (Killick, 2010). The need for Import Substitution Industrialization (ISI) at the time can also be rooted in the infant industry argument. Krugman et al. (2012) put forth that most domestic industries at the initial stages are too small and not well established; hence need some form of protection from international competition until the time they could grow stronger enough to compete internationally. To achieve government's industrialization goal through ISI, a highly restrictive trade policy regime was adopted coupled with several controls. For instance, there were strict controls on import quantities through the Bank of Ghana's exchange rate allocation (Werlin, 1994). There were also strong controls on imported inputs leading to a massive capacity underutilization (Aryeetey and Harrigan, 2000).

The results of such a strategy have been mixed. On the one hand, Ghana witnessed a high GDP growth and became the shining star of Africa. The country had large foreign reserves and a high per capita income as per African standards with an inflation rate of less than 1% (ODI, 1996). Indeed, the average income of Ghana at this time was about the same as that of Mexico or South Korea as asserted by the ODI (1996). Hence, it earned the name as one of the stronger economies in developing countries and was classified internationally as a 'medium income' country (ODI, 1996). Manufacturing output also increased substantially according to a World Bank report (World Bank, 1987). Additionally, a huge infrastructural development took place ranging from the building of new schools, hospitals, power stations, provision of piped borne water to several people, the establishment of a modern artificial harbour in Tema to the creation of a hydro-electric power plant -Volta River Project (Killick, 2010). Such infrastructure according to E.N. Omaboe, the acting Chairman of the Planning Commission was capable of

supporting higher level productive services (Killick, 2010). Furthermore, SOE's contributed significantly to job creation in the Ghanaian labour market because about 50% of the formal labour force were engaged in SOEs by 1980 as against the African average of 19%. On the other hand, some of the state projects were capital intensive but had no immediate returns or failed to generate adequate returns; the survival of such enterprises meant more monetary support from government. It is believed that about 13% of government's total expenditure in the form of subsidies, equity contribution and capital grants were allocated to SOEs in 1982 alone (Herbst, 1993). In fact, public enterprises recorded large aggregate losses according to Killick (2010). For instance, Swanson and Wolde-Semait (1993) report that the deficits of public enterprises in Ghana were about 0.2-3.3% of GDP between 1980 and 1982. Therefore, the huge state investments did not yield the expected economic benefits (Killick, 2010) and the country was left nearly bankrupt (Clark, 1995). Additionally, the fundamental stability of the Ghanaian economy was destroyed due to cocoa price collapse in the mid-1960s, which made it impossible for Nkrumah to continue his plans (Clark, 1995). Consequently, Ghana recorded balance of payment deficits with its foreign reserves depleted in the early 1960s. The economy was therefore in disarray, subsequently, an economic hardship ensued leading to the overthrow of Nkrumah's government in a coup d'état in 1966.

Since then, Ghana witnessed a series of coup d'états and political instability for close to two decades. To sustain economic activity during these periods, Kraus (1991) posits that the regimes of 1970 – 81 embarked on massive deficit spending leading to hyperinflation. In addition, the overvalued exchange rate resulted in reduced prices to exports leading to a sharp decline in exports but made imports cheaper (Kraus, 1991). The resulting effect was an economic downturn/meltdown of the once vibrant economy with the plummeting and fluctuating economic growth rates. For instance, Ghana's per capita GDP fell by over 30% from 1970 to 1981. The World Bank attributes the decline in GDP to "poor economic policies, a deterioration in the external terms of trade in the 1970s that led to substantial declines in income in the 1970s and early 1980s" combined with "the return of over 1 million Ghanaians from Nigeria in 1982-83, and a prolonged drought that severely affected the food and employment situation" in the country (World Bank, 1994:77). Aside the country's declining growth in the 1970s and 1980s, this period was also characterized by rising inflation rates which reached as high as 123% by 1983, low savings and investments and plummeting cocoa prices (Ghana's major export commodity and largest foreign earner). Cocoa production fell from over 400,000 metric tons in the early 1970s to about 300,000 metric tons in mid 1970s

and declined further to 225,000 metric tons in 1981/1982. Mineral production also declined by 32% whilst gold fell by 47% during this period (Kraus, 1991). Private businesses also suffered from acute shortages of imported inputs and spare parts as well as a steep decline in the real aggregate demand in the economy (Kapur et al., 1991). Thus, the period 1977 – 1983 has been described as the worst in the growth performance history of Ghana (Mckay and Aryeetey, 2004).

2.2 Trade Policies and External Trade Performance Prior to 1983

In general, policies of government before 1983 were inward looking and tilted towards the public sector. Other general features of the period were the frequent change of governments via coups d'états, inconsistent economic policies and a decline in the economy. A major element that affected trade was the exchange rate which was initially controlled and administered through a fixed rate system. In terms of trade, the pertinent features involved import licensing, high tariffs, quantitative restrictions, trade taxes and other fiscal instruments. With the aim of protecting the domestic industry, restrictions in the form of an import licensing system was put in place to control imports. Three types of licenses existed and were neither auctioned nor resalable. Whereas, holders of an Open General License (OGL) could freely import whatever item was listed on the license, prior authorization was required in the case of the Specific License (SL) before importation. The third license, known as the Special Unnumbered License (SUL)[2] allowed importers who had their own foreign exchange to bring in imports since the availability of foreign exchange was a major challenge during this period (Oduro, 2000). However, due to trade balance problems, the issuance of the specific license became dominant with most items transferred onto it and some 150 items either restricted or banned by the early 1970s. The OGL gradually waned out whilst the SL was often in and out of the system. The frequent change of that license is said to have made planning difficult for the private sector. Besides import licenses and export permits were also required in some cases.

Other policy instruments included the prior cash deposit system, which was in place until 1981 and required importers to deposit a percentage of the value of the import license with the Bank of Ghana before the issuance of the license. However, no prior payments were needed with the importation of goods such as crude oil and fertilizer. Hence, the policy was favourable to importers of non-consumer goods. Further instruments involved credit controls whereby credits to import trade were limited as it was not considered a priority area. Therefore, the share

[2] The SUL was later known as Special License.

of commercial bank credits to import financing declined over this period. Moreover, different lending rates were applied, which was advantageous to exporters but limited imports. For example, between the late 1970s and 1981, lending rates for import financing was 18% as compared to 13% for export financing (Oduro, 2000). Furthermore, to diversify the country's exports as well as increase manufactured exports, an export promotion package was instituted in 1969. These included an income tax rebate, export bonus, automatic renewal of import licenses and a waiver of local taxes for exporters. By this, exporters received a waiver on sales and excise duties on goods that were exported and were also entitled to a refund on domestic duties paid on raw materials used to produce manufacture exports. Also, import licenses of raw materials that were of importance to manufacturing were automatically renewed. With respect to the export bonus, exporters were awarded a 10% bonus that was equivalent to the value of their increased export earnings in relation to their previous earnings. Manufacturing firms also received income tax rebate based on the percentage of total output exported. For instance, a 50% rebate was awarded on 25% export of total output, 33.3% with exports of 15 – 25% and 10% on exports of 5 – 15% (Jebuni et al., 1992). Thus, the manufacturing sector grew, and its share of GDP increased to 9% in 1969 from 2% in 1957 (GATT, 1992).

Among other incentives was the foreign-exchange retention scheme offered to non-traditional exporters that allowed them to retain a proportion of their foreign earnings for the purchase of equipment's, machinery, raw materials needed to produce exports. The bureaucracies related to exporting were also reduced with the abolishing of export licenses in 1970 and the simplification of exports documentation. Aside these incentives, the Ghana Export Promotion Council[3] was setup in 1969 to promote export trade. In the following year, the Ghana Export Company was also established to assist with the sale of Ghanaian manufactured goods abroad. However, from Table 2.1, real non-traditional exports witnessed a declining trend since the 1970s and reached its lowest in 1980 of 31.3 million cedis and has since been fluctuating. Its share of total exports followed a similar trend. Likewise, exports share of GDP declined over the period except that its lowest contribution was recorded in 1982. This can be attributed to the overvalued currency during this period which made exports unprofitable, hence the declining trend (Jebuni et al., 1992).

Taxes on imports and exports were the other key instruments employed during the period for the purposes of increasing government revenue. To this end, a three-tier tariff structure of 35%,

[3] The council became an Authority in 2011.

60% and 100% was in place with a maximum tariff of 100%. Also, efforts were made to increase non-cocoa export tax revenues. However, frequent changes in the tariff schedules did not allow for the attainment of revenue targets. For instance, major tariffs restructuring was announced in the budgets of 1972-73, 1973-74, 1977, 1979 and 1980. This was further worsened with the misclassification of goods which made tax evasion eminent. The trend of trade contribution declined considerably over the period reaching as lows as 6.3% of GDP in 1982 from 63.6% in 1960, about ten times less, as can be seen in Figure 2.1. Hence, the country that could be classified as middle income as per international standards in the 1960s became a low-income country by 1982 (Aryeetey and Tarp, 2000). Moreover, the political instability, poor economic conditions, policy reversals and lack of direction led to an acute economic downturn between the 1970s and 1980s in Ghana.

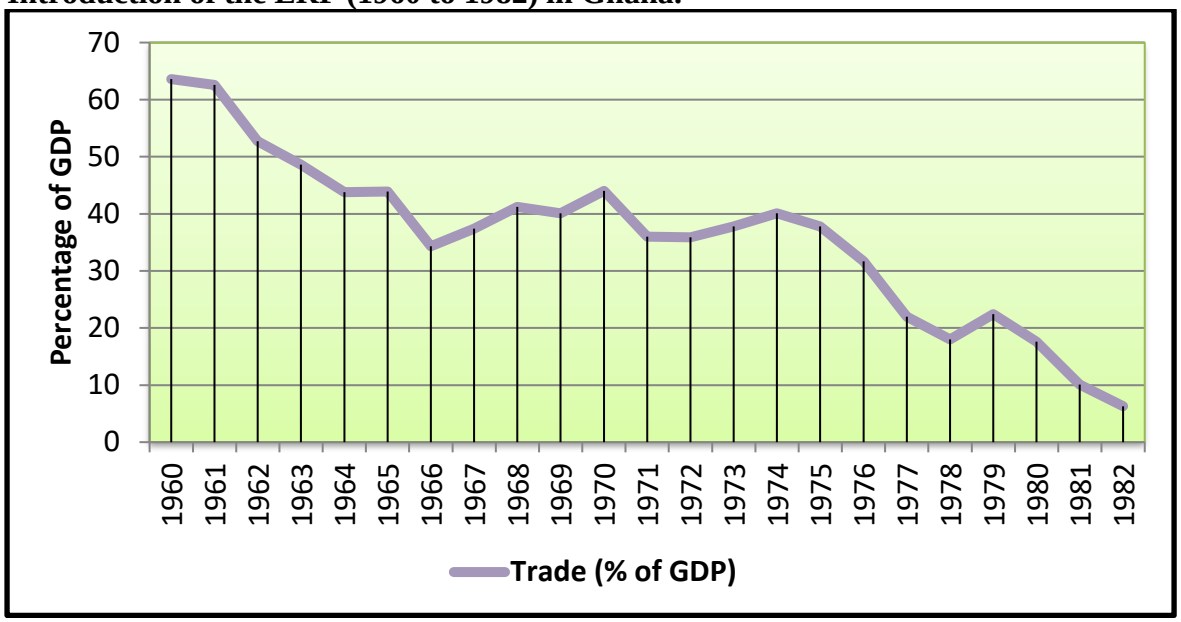
Table 2.1: Export Data for Ghana's Non-Traditional Exports (NTEs) from 1970 to 1990.

Year	Real NTEs (1980 ¢m)	Share of NTEs in Total Exports (%)	Exports to GDP ratio (%)
1970	1255.9	9.3	20.37
1971	1181.1	12	14.52
1972	458.5	3.4	19.52
1973	610.4	4.2	19.91
1974	687.7	4.3	19.68
1975	671.6	5.0	18.83
1976	410.4	5.1	14.29
1977	217.3	4.7	10.32
1978	106.7	2.9	7.430
1979	114	2.8	9.640
1980	31.3	1.1	7.310
1981	429.3	30.1	4.260
1982	142	15.7	2.780
1983	564.3	32.6	5.550
1984	139.9	6.0	7.120
1985	427.6	11.7	9.670
1986	186.3	2.2	18.47
1987	279.7	3.1	19.19
1988	352.4	3.6	19.08
1989	333.6	3.2	19.03
1990	454.3	5.9	13.90

Source: Jebuni et al. (1992).

Notes: The table shows data for real Non-Traditional Exports (NTEs) using 1980 prices (in ¢m), the share of the NTEs of total exports in percentage and the export to GDP ratio in percentage.

Figure 2.1: Contribution Trend of Trade in Percentage of GDP Prior to the Introduction of the ERP (1960 to 1982) in Ghana.



Source: World Bank (2018), World Development Indicators.

The further stagnation and decline of the economy led to the 4th coup d'état in 1981 by Flt.Lt. Jerry Rawlings. The early years of his military regime was hit by hunger due to the early drought of the early 1980s and the repatriation of about one million Ghanaians from Nigeria in 1983. According to Kraus (1991), tax revenue fell to 5% of GDP in 1983 from 17% in 1973 coupled with foreign debt arrears of over $400m. The Ghanaian economy was in shambles and needed urgent repair. Therefore, the military government of Flt Lt. Rawlings with the assistance of the World Bank and IMF introduced an Economic Recovery Programme (ERP) in April 1983 to correct the economic imbalances and distortions of the stagnated economy and lead it back on its economic development track. As such, 1983 is noted to have ushered 'economic miracle' in Ghana (Barwa, 1995). Subsequently, political stability in Ghana commenced with democratic elections in 1992 and Flt. Lt. Rawlings was elected president.

2.3 The Introduction of Economic Recovery and Structural Adjustment Programmes (1983 -1989)

The ERP (1983 – 1986) was made up of structural adjustment programmes of the World Bank and stabilization policies of the IMF. The programme had a 4-year time frame with 1983 as the first year and was aimed at moving away from the government/state-controlled economy into one that is shaped by the forces of the market. Hence, its key feature was the shift from the over protected and inward-looking economy via ISI strategy to a liberalized outward looking economy led by the private sector. The main themes of the ERP included: trade and exchange rate liberalization; privatization of state-owned enterprises; fiscal and monetary discipline;

financial liberalization; and the promotion of manufacturing industries. These were captured under three phases of the programme known as stabilization; rehabilitation; and liberalization and growth. The initial focus of the policy was stabilization through basic reforms in economic policy and restructuring of supporting institutions. This was meant to relief the country from its crisis at the time and to provide the basis for a sound macroeconomic structure, thereby setting the tone for the long-term restoration of the country to a satisfactory growth path. As such, relative prices were to be realigned to favour production and export sectors as well as reduce government budget deficits and inflationary pressures (World Bank, 1984).

The fiscal policy formulated as part of the ERP was meant to ensure financial discipline and eliminate high deficits. Fiscal policies meant to increase government revenue through taxes (i.e. personal taxes were raised to 35% from 25%) and user fees (education, health, etc) were introduced whilst cutting on government spending. Government revenue was also to be improved by maximizing revenue collection and widening the tax net. Monetary policies on the other hand entailed increases in interest rates, reducing public wage bill through an income policy and the devaluation of the over-valued cedi (ODI, 1996). A labour reward scheme via performance meant to result in higher productivity was also introduced. However, the income policy came along with the redeployment/retrenchment of labour from the public sector. However, those who lost their jobs were meant to be absorbed especially by the informal private sector (Gockel and Vormawor, 2004).

After fiscal and monetary policies of the ERP, rehabilitation took center stage. This involved structural and institutional reforms with the aim to privatize state-owned enterprises and promote private enterprises. The private sector was to take a center stage in making the country's industrial sector competitive internationally through local resource-based industries that have the capacity for exports and efficient import substitution (Ackah et al., 2014). In this regard, there was a reduction in corporate tax rates, institutions and committees were also established. It also included the rehabilitation of the country's road, port, and railway and transport infrastructure. In addition, government was to provide the needed raw materials and imported inputs to the productive sectors with a focus on boosting exports (World Bank, 1984).

The final stage of the ERP concentrated on the liberalization of trade and the financial sector with the view to relax the strict trade regime and payment controls. In this regard, much focus was on the development of an effective import system and of a buoyant export sector as well as the use of a market-determined exchange rate through tariff and tax reforms, export

diversification and removal of price controls. At the domestic level, state price controls were eliminated, and non-traditional exports promoted. At the same time, trade barriers were lessened with a reduction on import restrictions (removal of quotas, reduction of tariffs) and the withdrawal of export controls. For instance, in 1983, import tariff rates were revised downwards with tax schedules of 10%, 20%, 25% and 30% from schedules of 35%, 60% and 100% (Oduro, 2000). Hence, the maximum import tariff saw a drastic reduction from 100% to 30%. It is asserted that such schedules remained fairly stable until 1986 when import duties and sales on consumer goods and luxury goods respectively were reduced (Jebuni et al., 1994). Therefore, this period began the transition to an import liberalization regime. Competition was also introduced to the monopolies of the public sector. In addition, the incentive system for production and exports was further strengthened by removing distortions and rigidities (World Bank, 1983). Financial reforms on the other hand entailed the enactment of laws to strengthen bank supervision and the introduction of the weekly exchange auction system in September 1986.

To sustain the initial gains of the ERP, the government recognized the need for further adjustments leading to the introduction of the Structural Adjustment Programme (SAP) in 1986. In other words, the ERP was meant to support the macro-economic objectives of the ERP and to stimulate the growth of some sectors via the removal of constraints impairing such growth. The words of Barwa (1995: ix) rightly captures the need for SAP after the ERP: "It is widely acknowledged in Ghana that the poor majority would have been worse off without some form of adjustment". The main instruments of the SAP, which encompassed lots of sectors of the economy pertains to: i) trade policies, ii) cocoa sector policies, iii) policies on public expenditure, iv) reforms in state owned enterprises, v) strengthening the public-sector management, and vi) actions to mitigate the social impacts of structural adjustments (GOG, 1987). In the coming pages, this thesis will address policies of the programme relating to trade and the private sector.

The basic objective of the SAP (1986/7 – 1989) was to lay a firm foundation for the development of a buoyant, self-reliant and increasingly integrated economy (World Bank, 1987). To achieve this, private sector response was recognized as key to the success of the programme. Thus, incentive policies were put in place to stimulate growth and investments. These included the maintenance of a stable and attractive environment for the private sector as well as seeking joint ventures for selected public enterprises with foreign and local private investors. It also involved the creation of opportunities that allow for dialogue between the

government, business and labour. Institutional measures were also put in place to back such policies (GOG, 1987).

In terms of trade policy, this period marked the second stage of import liberalization in Ghana beginning with the reintroduction of a formal exchange rate system in 1986. Incentive policies in the form of exchange and trade reform policy aimed at substantially increasing reliance on market mechanism for the allocation of resources and reducing distortions through the removal of all quantitative restrictions on imports were introduced. Further reforms were geared towards establishing a realistic exchange rate and continuing related tax and tariff reforms. Hence, the two windows for the transaction of foreign exchange were unified into a single market in February 1987, whereby all transactions requiring foreign exchange were subjected to the weekly auction rates (GOG, 1987). Subsequently, the exchange rate market was fully liberalized in 1988 with forex bureaus licensed to operate. Although the import license system was still in place, a redefinition of the license categories was done when the new exchange system was introduced in 1986. So, 'A' license holders could bid for foreign exchange at the exchange auction but with restrictions on the type of goods that one could import with the license. However, 'S' license holders were not allowed to bid for foreign exchange at the auction and a third license was offered to government organizations for the imports of essential goods and services (Oduro, 2000).

Furthermore, reforms in trade taxes including tariffs were introduced to provide a moderate and effective pattern of effective protection. To this end, import tax schedules were further reviewed downwards in 1988 by about 5 to 15-percentage points, thereby making import tariffs rates within 10% and 25%. Then again, import duties on both capital and intermediate goods saw a decline to about half of their 1983 levels by 1988. There was also a 10-percentage point reduction on sales taxes on imported goods (Oduro, 2000). Overall, import taxes reduced and were about 19% lower than their 1983 levels as of 1986. On the other hand, average export taxes were about 37% of their 1983 levels by 1989 (Jebuni et. al., 1992). The import licensing system, which was Ghana's main instrument to regulate imports, was finally abolished in February 1989 (GATT, 1992). Importers were only required then to file an import declaration form either at the commercial banks or at the point of entry. A reform of the company income tax to provide appropriate incentives to the productive sectors was also introduced. Tax policies were being progressively adjusted to encourage savings. For instance, the company income tax for manufacturing enterprises was reduced from 50% to 45% (i.e. the rate applicable to other priority sectors) in 1987 with the aim of increasing investment and employment opportunities

in the sector (GOG, 1987). A duty-exemption on packaging materials was also added to the existing export promotion incentives.

The exchange and trade reforms were meant to shift incentives further from trading and rent-seeking activities to production, and to encourage manufacturers to shift emphasis towards exports. In this regard, an export promotion programme initiated earlier included the abolition of export permits, removal of tax elements from exporters cost, as well as simplifying the documentation requirements for exports. It also involved the reorganization of the Ghana Export Promotion Council. Non-traditional products exports were also encouraged through the increase in the retention of foreign earnings for exporters from 20% to 35% (GOG, 1987). Also, government's reduced role in the productive sectors, and its planned rehabilitation of infrastructure and the overall improvement in incentives was intended to improve the environment for the private sector (World Bank, 1987). The ERP and SAP have mostly been known as ERP, henceforth will be represented as such in this thesis.

Ghana's external arrears on international payments were reduced by $39 million through the ERP, far above the required reduction of $10 million by the end of August 1983 (GOG - ERP, 1983). Thus, Meng (2004) posits that Ghana did regain its international credit standing as well as curb the worst excesses of economic protectionism through the ERP. Other benefits emanating from the ERP were the substantial gains in output coupled with a decline in inflation and improvement in the fiscal performance (see Table 2.2). The gross fixed capital formation as a percentage of GDP more than doubled by the second phase of the ERP in comparison to the pre-ERP period as reported in Table 2.2.

Table 2.2: Before and After ERP Analysis of Key Macroeconomic Indicators.

	Annual Average 1978 – 83	**Annual Average 1984 – 90**	**Annual Average 1991 – 1994**
Real GDP growth (%)	-1.34%	5.4%	4.5%
Balance of payments overall (US $m.)	-102	98.3	59.7
Narrow fiscal deficit (% of GDP)	-5.95%	0.21%	-1.3%
Broad money growth (%)	36.6%	50%	46.4%
Inflation CPI (%)	73.7%	29.8%	19.9%
Gross fixed capital formation (% of GDP)	5.2%	10.8%	14.8%

Source: Aryeetey and Harrigan (2000).

Note: The Before ERP covers from 1978 until 1983; 1984 to 1990 is considered as the first phase of the ERP and 1991 to 1994 refers to the second phase of the ERP.

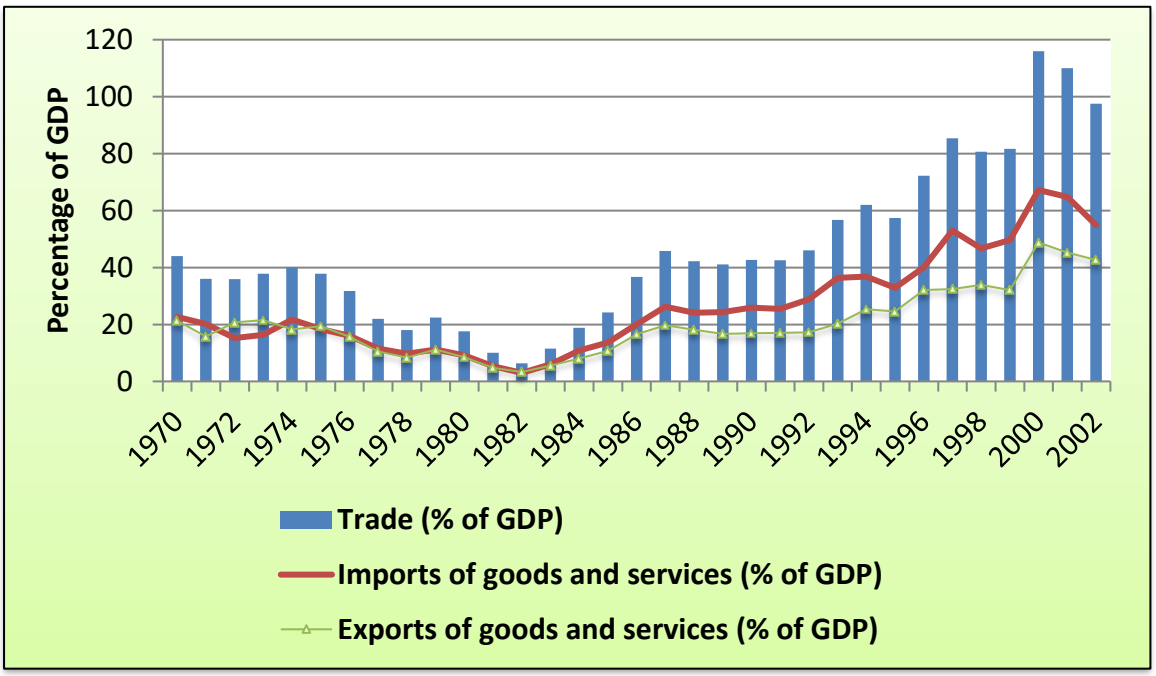
Moreover, it can be seen from Table 2.2 that Ghana recorded an annual average real growth in GDP of 5.4% during the 1984 – 90 period, which is a great improvement in contrast to minus 1.34% in the pre-ERP period (1978 – 1983). Also, the World Bank (1987) reported that Ghana's economic performance improved sharply after a decline in output in 1983 with an average GDP growth of 6.3% for the period 1984 – 1986. Furthermore, Table 2.2 shows that the balance of payment improved significantly to a surplus of $98.3m in the first phase of the ERP from its previous deficit of $102m before the ERP. In addition, fiscal deficit to GDP recorded a surplus of 0.21% from a deficit of about 6% as shown in Table 2.2.

The country's GDP also grew above that recorded in Sub-Saharan Africa and low-income countries (see Figure 2.3 in subsection 2.5) and was therefore widely touted as the 'Front-runner in adjustment' in the late 1980s (Husain and Faruqee, 1994). Growth in manufacturing also averaged 14% per annum whilst services grew by 6% per annum. Accordingly, the World Bank (1987) stated that Ghana under the ERP enjoyed three successive years of strong per capita income growth, the first of its kind in a decade. Furthermore, government revenue through the ERP rose from just 5% of GDP in 1983 to 14% in 1986, improving the fiscal position of the government. In like manner, merchandized exports and imports as shares of GDP witnessed substantial expansions from 18% and 29% in 1993 to 28% and 39% in 1998 respectively (TPR, 2001). Moreover, inflation which was as high as 123% in 1983 declined to 25% by 1986. Inflation further fell to about 20% in the second phase of the ERP from a pre-ERP rate of 74% as shown in Table 2.2.

A key contribution of the ERP was its focus on the private sector as the prime mover of the country's industrialization agenda. Although the private sector response to the economic reforms were slow due to "the protracted economic decline prior to the 1983 which left the private sector in a state of virtual devastations from which it was difficult to recover within a short time" (Kapur et al., 1991:15), nevertheless, gains to the private sector were not left out. For instance, credit to the private sector increased from 5% of GDP in 1984 to 8% in 1986. Besides, a new investment code designed to encourage both domestic and foreign investment as well as protecting investors was approved. In addition, a sustained gain in real private national disposal income per capital of about 2.8% per year was recorded for the first time in two decades (Kapur et al., 1991). Furthermore, the ERP improved the private sector environment as decisions that affect the sector were now brought before a tripartite committee of government, trade unions and employers. Moreover, the private sector was recognized as a key stakeholder in development, such that it was involved in higher levels of economic policy

formulation and had a representation on the National Economic Commission (World Bank, 1987).

Figure 2.2: Contribution of Trade to Growth (Pre- and Post-ERP) showing Trade, Imports and Exports as a Percentage of GDP from 1970 to 2002.



Source: World Bank (2018), World Development Indicators.

Furthermore, Ghana's manufactured exports dramatically increased from US$ 3.5 million in 1986 to US$ 14.7 million in 1991. Both imports and exports to GDP witnessed an increasing but fluctuating trend since 1982 as shown in Figure 2.2 above. In general, Ghana's trade contribution to GDP increased substantially after 1982 with the highest contributions occurring in 2000 and 2001. Then again, the country's export earnings rose to about 90% between 1983 and 1988 from US$ 460 million to US$ 869 million (GATT, 1992).

Not only did the ERP contribute to Ghana's economic prospects but it also impacted positively on the political arena of Ghana as efforts to return to constitutional rule started within this period. Generally, the World Bank (1992) asserts that Ghana's adjustment programme is one of the more successful ones in Sub-Saharan Africa. In fact, Corbo and Fisher (1995) posit that Ghana has been the most successful adjuster in Africa. On the other hand, opponents of the ERP have described the programmes as a failure that caused a lot more distortion than it did correct. It has also been argued that the private sector response to the reforms have been slower than expected. It is to such a debate that this study seeks to contribute.

2.4 Economic Reforms and Progress (1990s - early 2000s)

The economic performance of Ghana since independence can be categorized into three phases: Immediate post-colonial period / Independence (1957 – 1966), post-Nkrumah/Era of coup d'états (1966 -1982) and 1983 to present (era of economic restoration and development). The first period had an average economic growth of about 4.5% per annum coupled with relatively low inflation rates (Anaman and Osei-Amponsah, 2009). This period witnessed the establishment of several state industries across the country; the setting up of the Ghana Industrial Holding Corporation (GIHOC) and the development of the Akosombo hydroelectric dam and the new township and industrial city around the Tema port. Hence, Anaman and Osei-Amponsah (2009) opine that Nkrumah's regime made the initial attempts to industrialize Ghana. It was characterized by inward-looking policies of import substitution, industrialization and the dominance of state enterprises. The second phase was home to political instability with the frequent change of governments via coup d'états[4]. Therefore, the industrialization efforts of the previous period were largely abandoned. Frequent changes in policies brought about a lack of policy direction.

The third phase is a period marked by political stability, moderate economic growth of about 4.8% per annum alongside moderate inflation rates and trade liberalization. This period witnessed the major stages of Ghana's outward-oriented economy. That is, the transition to import liberalization in 1983 and the liberalized trade regime since 1990. A major feature of this phase was the shift to the private sector as the backbone of the Ghanaian economy, which resulted in the privatization of state enterprises. Therefore, improving the attractiveness of the private sector and stimulating private investments were key at this stage. To that end, corporate income tax rate applicable to manufacturing firms was reduced from 45% to 35% in 1991. Also, corporate tax rebate on exports was raised from 25% to 30%. With regards to trade, import duty on semi-processed intermediate goods was reduced to 10% from 15% in 1991 whilst all quantitative restrictions on imported raw materials for export manufacturers were eliminated. A 100% duty drawback on imported inputs was introduced and custom duty on textile imports was reduced to 10% from 40% (World Bank, 1991). In terms of strides in the political arena of Ghana, this period witnessed the conduct of democratic election in 1992 that returned the country to multiparty system and bringing about participatory governance/decision making.

[4] There were 4 coup d'états and 7 Heads of State within this period.

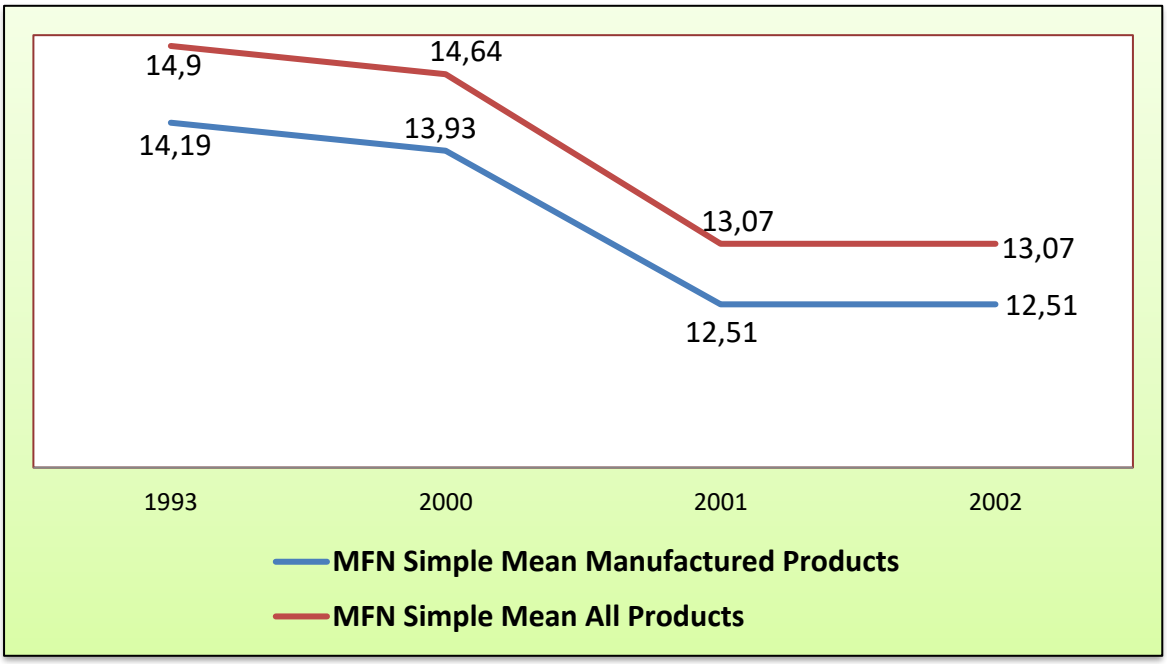
By this period, the import licensing system had been abolished and the once highly controlled exchange rate deregulated. Documentation requirements for both imports and exports were also simplified. Hence, it is argued that Ghana's trade policy began at this point "to reflect a strong belief in international competitiveness, and the recognition that protectionism and import controls can only prevent the levels of economic growth associated internationally with competition-induced structural Change" (GATT, 1992:13). A policy objective of government during this period was to lower average tariffs to below 10%. Until January 2000, Ghana had a four-tier tariff structure with rates of zero, 5%, 10% and 20%. Mostly, raw materials and capital goods attracted rates of zero and 5% whilst intermediate and consumer goods mostly had rates of 10% and 20% respectively. The simple average Most Favoured Nation (MFN) tariff fell to 13% by January 2000 from 17% in 1992. It was however at 14.7% in February 2000 because of the imposition of a special import tax of 20% on about 7% of tariff lines. This resulted in a rise in most tariffs especially consumer goods which were now at 40% from its previous rate of 25% (TPR, 2001). It's worth noting that all tariff duties in Ghana are ad valorem and based on the Harmonized System (HS). Based on HS, the average MFN applied tariff on manufactured products was about 13.8% by 2000 and 14.6% as per ISIC[5] definition (TPR, 2001). In Figure 2.3, the simple average of both manufactured and all products have seen a declining trend since 1993. Manufacturing simple average decreased from 14.19% in 1993 to about 12.51% by 2002. Likewise, the average tariff on all products fell to 13.07% in 2002 from 14.9% in 1993.

Other policies include the promotion of exports especially its diversification from traditional exports. For example, companies into non-traditional exports paid a tax of 8% instead of the normal company rate of 35%. However, Ghana continues to be a net importer despite efforts to encourage more exports (see Figure 2.4). Nonetheless, the trade balance deficit between 1990 and the early 2000s has not been as much as that witnessed since 2005. The highest and least merchandized imports were recorded in 1999 and 1991 respectively. This probably reflects the increased access to imports via trade liberalization over the years. Corporate tax rebates were also increased in 1991 to a maximum range of 60-75% from a minimum range of 30 - 40% (see Table A.1 in Appendix A for the full details of manufacturing sector rebates).

[5] It includes processing of food, beverages and tobacco as manufactured products, but these are excluded from the HS definition of manufactured products.

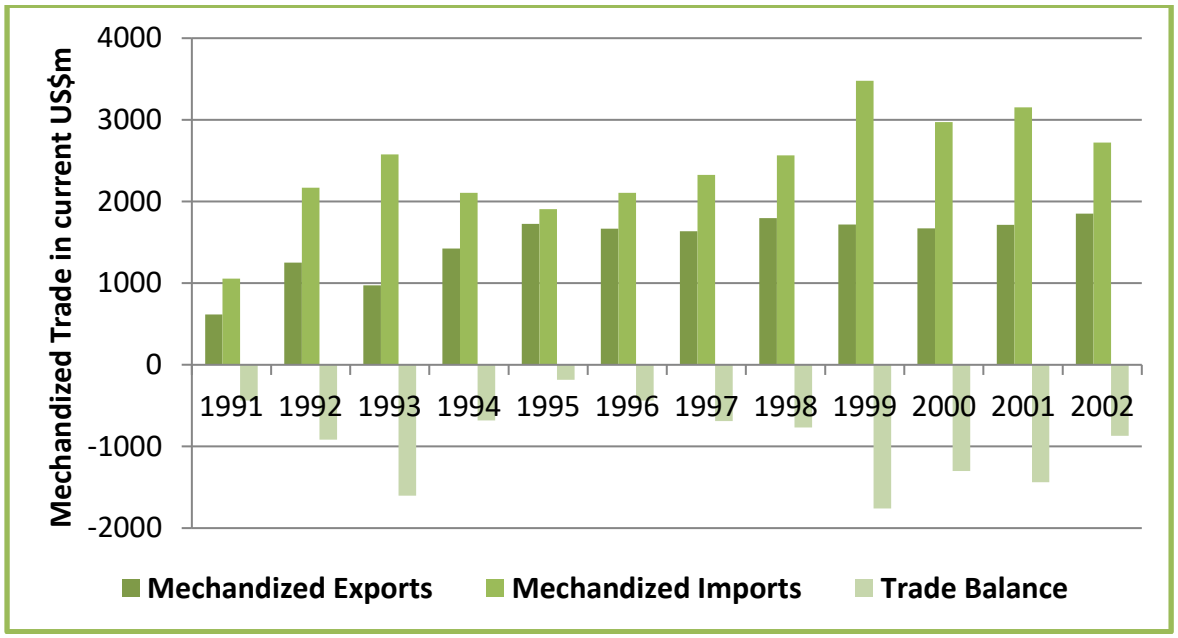
Then again, the super sales tax introduced in 1990 on luxury goods and ranging from 75 – 500% were lowered to 10 - 100% in 1991 (GATT, 1992).

Figure 2.3: Ghana's Most Favoured Nation Simple Mean Tariffs for Manufactured Products and for All Products, 1993 – 2002.



Source: World Bank (2018), World Development Indicators.

Figure 2.4: Ghana's Total Merchandized Trade, by Value in Current (US$ m) from 1991 to 2002.



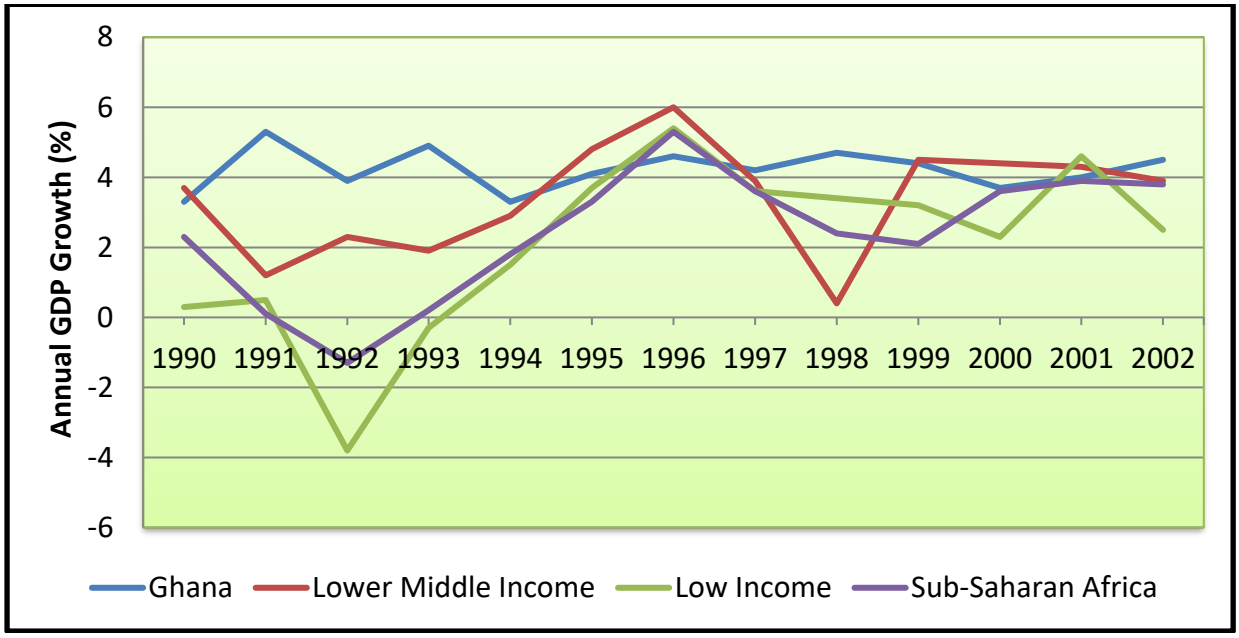
Source: World Bank (2018), World Development Indicators.
Note: The trade balance refers to the difference between exports and imports for each year.

In 1990, an ECOWAS trade liberalization scheme was launched and Ghana as a member offered preferential rates on some goods from member countries. For instance, some products

from the community that qualified for such preferential treatment attracted rates of 8%, 16% and 20% in comparison to rates of 10%, 20% and 25% respectively on same products from other countries (Brafu-Insaidoo and Obeng, 2008). Ghana has also been a member of the World Trade Organization (WTO) since 1995 and applies the Most Favoured Nations tariffs on all imports except for those from ECOWAS countries, which have been duty-free since 1996. However, products enjoy duty-free rates only when they meet the ECOWAS rules of origin and have at least 60% of their raw materials sourced from within the community.

Between 1991 and 1993, the Structural Adjustment Credit (SAC) facility of the International Development Association (IDA) sought to further restructure import duties in order to have a lower and more uniform tariff structure as well as encourage the development of non-traditional exports and more efficient import-substitution industries. The vulnerability of the economy was to be reduced via the diversification into processed and manufactured exports. In this light, an annual real GDP growth of about 5% was to be achieved within this period with a reduction in inflation of about 5% by 1993 (GATT, 1992). It can be seen in Figure 2.5 that in terms of growth, Ghana performed well above low income, lower middle income and Sub-Saharan African countries between 1991 and 1994.

Figure 2.5: A Comparison of GDP Growth (Annual Percentages) between Ghana, Low Income Countries, Lower Middle-Income Countries and Sub-Saharan Africa for the Period 1990 – 2002.



Source: Wold Bank (2018), World Development Indicators.

After which it slipped behind them until 1997/1998 when its growth performance was top in comparison to the others. It outperformed all the other countries again in 2002 as depicted in

Figure 2.5. Generally, Ghana's growth did not do badly against the countries shown in Figure 2.5 within the period considered.

Furthermore, the Government of Ghana with a grant of US$80m from USAID launched the Ghana Trade and Investment Programme (TIP) in 1993 with the aim of increasing the country's exports earnings by diversifying the country's exports via the expansion of non-traditional exports (IMF, 2000). Hence, the programme which lasted until 1997 targeted firms and industries into exporting, including manufacturing and mining subsectors (Ackah et al., 2014). It was also meant to create jobs as well as stimulate and attract businesses and investments into export production. In this regard, about 15000 fulltime jobs were said to have been created between 1993 and 1995 in the NTEs sector that delivered wages said to be substantially more than the minimum daily wage (IMF, 2000). The TIP was later replaced with the Trade and Investment Reform Programme (TIRP). As part of the TIRP, a tariff structure analysis was to be undertaken in order to enhance the competitiveness of the local industry as well was help remove distortions impeding the exports of goods that the country has a comparative advantage (IMF, 2000).

As part of the Gateway to Africa project, the Ghana Free Zones (GFZs) Act 504 was enacted in 1995 and intended to secure a more outward-looking economy and to attract local and foreign investments. The main objective of the free zones act is economic development through increased export output, technology transfer, foreign direct investment and growth in foreign exchange earnings. The Act is based on a wholly private sector led zones development concept with limited government involvement. In that respect, the building, management, and operation of the free zones is left in the hands of the private sector, whilst government plays the role of facilitation, monitoring and regulation through the Free Zones Board[6] (Mante, 2010). The GFZs include 4 export processing zones namely Tema, Sekondi, Shama and Boankra[7], 2 free ports (Tema and Takoradi), one airport free zone (Kotoka) and about 150 single factory enterprises (Bost, 2011). It therefore has three special features as: Export Processing Zones (EPZs), Free Trade Zones (FTZs) and Free Points (FPs). The EPZs and FTZs are geographically confined and demarcated whilst the FPs are spread throughout the country. The act creates 2 main types of private investments: Free Zone Developers (FZDs) and Free Zones

[6] The Ghana Free Zones Board is now known as the Ghana Free Zones Authority.
[7] The Tema EPZ located in the Greater Accra region is operational and the other three are still under development. The Sekondi and Shama EPZs are located in the Western region whilst the Ashanti Technology Park in Boankra is located in the Ashanti region (GFZB, 2014).

Enterprises (FZEs). The free zones developers invest in infrastructural development as well as the provision of services to the free zones' enterprises. On the other hand, investors in free enterprises must establish enterprises engaged in the processing and manufacturing of goods for exports (at least 70%). Though free enterprises can sell about 30% of their products in Ghana, such products are considered as imports and attract the necessary duties. To attract foreign direct investments, the act allows for 100% foreign ownership of enterprises within the free zones. Personal incomes earned by foreign employees working in the free zones are also non-taxable in Ghana. Other incentives of the act include a 10-year income tax holiday with a maximum of 8% post-holiday tax on profits; non-payment of direct and indirect taxes and duties on imports; and a shareholder exemption from payment of withholding taxes on dividends (GFZ ACT 504, 1995).

Furthermore, some tariff reforms were introduced in 1994 to provide technical support to viable domestic firms that were exposed to unfair competition via trade liberalization. Hence, tariffs were to be rationalized such that any abuses of the custom and import duties on building cost that was removed in 1991 would be prevented. To this end, a 10% import duty was imposed on building materials in 1994 and domestic sales tax was equalized with import tariffs. Also, import tariff reductions on goods meant for export production was implemented in 1998 (Ackah et al., 2014). Generally, the imports and exports regime in Ghana is governed by the Imports and Exports Act of 1995. Under this Act, export permits are required for goods such as timber products, fresh fish and precious minerals. As per the Act, there are no specific requirements for the exports of non-traditional goods. Also, the Commissioner of the Customs, Excise and Preventive Services (CEPS) has authority to grant concessionary rates on inputs imported by approved manufacturers as well as VAT exemptions (UNCTAD, 2003).

Institutions have not been left out in the reform process since the 1990s. In this regard, some institutions have been set up to promote and strengthen the development of the private sector. Indeed, Acemoglu and Robinson (2013:75) argue that Inclusive Economic Institutions (IEIs) "foster economic activity, productivity growth, and economic prosperity". Hence, asserting that institutions are key engines of economic prosperity. Among the institutions established in Ghana as part of reforms are the following:

- ***Private Sector Advisory Committee, 1991:*** it was instituted to advice on how the business enabling environment could be improved for the private sector to strive. In other words, it was meant to increase private sector investments. In fact, its main

recommendations for reform were implemented by the government and was therefore seen to be successful (Ackah et al., 2010).

- ***Private Enterprises Foundation (PEF), 1994:*** an advocacy group for the private sector in Ghana. It is now known as the Private Enterprise Federation. It was established as an initiative of a number of business groups such as the Association of Ghana Industries, the Federation of Associations of Ghanaian Exporters and the Ghana Employers' Association with support from the United States Agency for International Development (USAID). Its membership stood at about 11 as of 2016.

- ***Ghana Investments Promotion Centre (GIPC), 1994*****:** to promote both domestic and foreign investments in Ghana. It was established under the Ghana Investment Act.

- ***Ghana Free Zones Board, 1995*****:** to oversee the implementation of the Free Zones Act (No. 504) that was enacted in 1995. So far, the Tema multipurpose EPZ which is home to the biggest seaport in Ghana is the only functional EPZ. The Sekondi and Shama EPZs have been awarded to Hansen Investment Company Limited and Black Ivy Company Limited respectively for development. On the other hand, the development of the Ashanti Technology Park has been hit with a lawsuit as per the 2014 GFZB annual report.

- ***Ministry of Private Sector Development:*** A ministry created by the Kuffour government in 2001 for the promotion of the Ghanaian private sector. However, this ministry no longer exists due to the change of government in the 2008 elections.

- ***Presidents Special Initiative (PSI):*** launched in August 2001, by the Kuffour-led New Patriotic Party (NPP) government. The initiative ended with the exit of the Kuffour government in 2008.

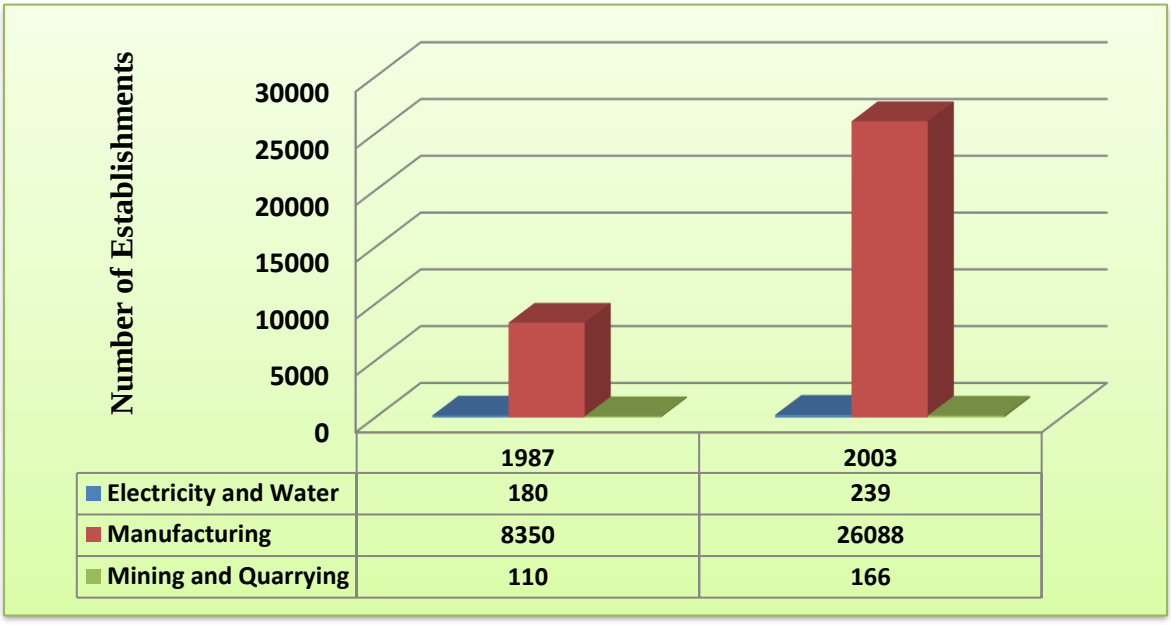
2.5 The Ghanaian Manufacturing Sector

The manufacturing sector in Ghana has received much attention from policy makers since independence. At independence in 1957, the industrialization agenda pushed by the Nkrumah-led government led to an increase in manufacturing share of GDP from 10% in 1960 to about 14% in 1970 (Clark, 1995). As a result, several industrial enterprises were created, including the Volta Aluminum Company (VALCO) smelter, textiles manufacturing, cement manufacturing, timber processing plants and vehicle assembly plants among others (Clark,

1995). Subsequent governments, over the years, have also strived to make the manufacturing sector a major engine of growth in the country.

Ghana's industrial sector is made up of manufacturing, mining and quarrying, utility services and construction. The manufacturing sub-sector has dominated the country's industry since independence. Figure 2.6 shows that since 1987, majority of establishments in industry are found in the manufacturing subsector and it continues to maintain its lead with increased number of establishments as of 2003.

Figure 2.6: Distribution of Establishments in Ghana's Industry: A Comparison of 1987 and 2003.



Source: Ghana Statistical Service (2005).

Over the 1987 – 2003 period, manufacturing firms grew substantially whereas E & W (Electricity and Water) and M & Q (Mining and Quarrying) subsectors recorded meager increases as displayed in Figure 2.6. For instance, as many as 26,088 manufacturing establishments, representing 95% of industrial establishments were in existence in the year 2003 from as low as 8,350 in 1987 as reported in Figure 2.6. Particularly, the distribution of establishments as per Figure 2.6 reveals that manufacturing enterprises grew as much as 212%, that is about three times higher in comparison to 51% for M & Q and a decline of about 33% for E & W enterprises within the 1987 and 2003 period. Also, manufacturing share in total employment has been far above those of the other sub-sectors in the industry since 1987 (see Tables 2.4 and 2.6). Due to data availability challenges, this subsection relies much on the 2003

industrial census, which is the latest in the country. This was carried out in October – November 2003 and November 2004 – March 2005, with 2003 as the reference year.

So far, the Ghana Statistical Service[8] has conducted three industrial censuses (1962, 1987, and 2003) in Ghana. The first was undertaken in 1962 and captured basic information on the structure and activity of all establishments into mining and quarrying, manufacturing, construction, electricity and distributive trade. Thus, it formed the basis for the conduct of subsequent censuses and surveys in the industrial sector. The second and third censuses were carried out in 1987 and 2003 respectively in two-phases each and have similar formats but differ from the first in the scope and coverage. Unlike the first, the subsequent censuses excluded household establishments except for those with a signboard of their industrial activity and covered establishments into the production and distribution of water. In the two recent censuses, an establishment was defined in accordance with the UN office for industrial census as "a single economic unit engaged in a single kind of business under a single ownership at a single location" (GSS, 2006:10). In both cases, the first phases involved the collection of basic data on all establishments engaged in mining and quarrying, manufacturing, and the production and distribution of electricity and water. In contrast, the second phases focused more on industrial establishments that engaged 10 or more persons[9] even though a representative sample of firms engaging less than 10 persons were also included (GSS, 2006).

In general, the Ghanaian manufacturing sector is mainly characterized by private owned micro, small and medium enterprises (see Table 2.3) that are often concentrated in the urban areas. For example, half of the manufacturing establishments are found in the Greater Accra and Ashanti regions[10], accounting for nearly 52% of jobs (see Table A.2 in Appendix A). As a result, privately owned establishments engage an overwhelming 95% of persons in manufacturing as reported in Figure 2.7 as of 2003. State establishments into manufacturing are very limited, accounting for less than 2% of manufacturing jobs in the country. The remaining 4.1% jobs are created in joint establishments owned by both the state and the private sector. Indeed, Figure 2.7 points to a minimal direct role of the state in manufacturing and could

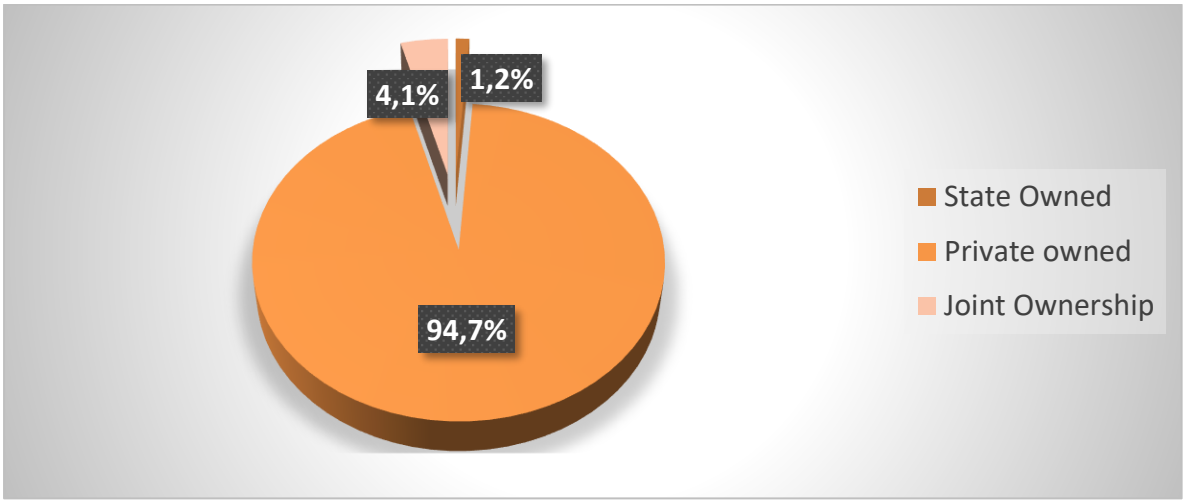
[8] The Ghana Statistical Service was known as Central Bureau of Statistics in 1962.

[9] Persons engaged refers to the total number of persons who work in or for the establishment and include working proprietors and active business partners plus learners (including unpaid apprentices') plus unpaid family workers.

[10] Greater Accra and Ashanti regions are the two most populated regions as per the 2000 population census with 2,905,726 and 3,612,950 inhabitants respectively. Greater Accra is home to the capital city of Ghana, that is, Accra, and Kumasi is the capital of Ashanti region. Both cities are among the top urbanized cities of Ghana.

well be an indication of governments commitment to the privatization agenda of the late 1980s. Subsequently, suggesting that the country did take its private sector led growth development strategy seriously.

Figure 2.7: Persons Engaged by Type of Ownership in Ghana's Manufacturing (2003).



Source: Ghana Statistical Service (2006), 2003 National Industrial Census Phase I Results.

Manufacturing firms in Ghana are mostly into resource processing and the production of light consumer goods. These include textiles and garments, food processing, sawmill and wood products, chemicals, fabricated metals and non-ferrous metal products, paper products, iron and steel products, and electrical equipment and appliances. Production in this sector is mostly focused on the domestic market. Manufacturing falls under the tutelage of the Ministry of Trade and Industry, the primary government agency that formulates, develops and implements policies as well as evaluates policies relating to the sector. According to the UNESCO (2016), manufacturing in Ghana is dominated by agro-industries, a high dependence on imported raw materials coupled with the use of obsolete technology and underdeveloped industry linkages. The UNESCO (2016) also asserts that Ghana's manufacturing sector has been exposed to increased competition as a result of trade liberalization alongside high cost of production and high interest rates. It is worth noting further that the Ghanaian manufacturing sector has and continues to be adversely affected by power shortages (Arthur, 2006). Although the sector is small, it is a significant part of the country's productive industry capacity and an important contributor to industry. For instance, in the year 2003, it accounted for 88% of jobs in Ghana's industry as shown in Table 2.4.

Table 2.3 depicts that a very large proportion, about 83% of persons engaged in manufacturing are found in establishments wholly owned by Ghanaians.

Table 2.3: Persons Engaged in Manufacturing by Size, Ownership, Legal Organization and Skills in Ghana, 2003.

	No.	%
Size		
Micro	84,816	34.83
Small	57,727	23.71
Medium	18,270	7.50
Large	82,703	33.96
Total	**243,516**	**100.00**
Nationality of Ownership		
Ghanaians	191,529	83.09
Non-Ghanaians	21,997	9.54
Mixed Nationality	16,983	7.37
Total	**230,509**	**100.00**
Legal Organization		
Private Limited	70,852	29.10
Public Ltd Company	8,056	3.31
Partnerships	4,499	1.85
Sole Proprietorship	113,557	46.63
Association/Group	35,339	14.51
Others[11]	11,213	4.60
Total	**243,516**	**100.00**
Level of Skills		
Skilled Workers	98,290	40.36
Unskilled Workers	39,982	16.42
Apprentice	75,528	31.02
Professional/Managerial	12,010	4.93
Other Workers	17,706	7.27
Total	**243,516**	**100**

Source: Ghana Statistical Service (2006), 2003 National Industrial Census Phase I.

From Table 2.3, it can be observed that non-Ghanaian establishments employed a mere 9.54% whilst a paltry 7.5% of jobs in manufacturing are in mixed owned establishments. This suggests that majority of jobs are created by home grown enterprises as found elsewhere (see Tipple, 2006). Consequently, the absence of such enterprises will result in high unemployment rates in the developing world. Indeed, the job creation capability of domestic firms is one of the major reasons put forth in favour of protecting domestic firms (Gashgari, 2016). Sole proprietorship is the most legal form of business organization within the Ghanaian manufacturing, accounting for about 47% of establishments as depicted in Table 2.3. It is followed by the private limited

[11]Others refer to Co-operative, NGO and External company.

establishments with 29% of the total enterprises in manufacturing. Interestingly, partnerships accounts for the least form of legal business organization with less than 2% of manufacturing enterprises. The distribution of the legal form of organization suggests that sole proprietorship is the most preferred, probably because of the ease of forming such types of businesses as well as the quick decision making associated with it due to the fact that the structures are non-hierarchical coupled with the absence of agency problems (Yang and Chen, 2009). On the other hand, partnerships are the least preferred, perhaps due to trust issues among partners and the dislike for profit sharing, that is, the love for one person takes it all mentality.

Apprenticeship was observed to be the second largest source of labour in the Ghanaian manufacturing subsector after skilled workers and constitutes about 31% of the manufacturing workforce as per Table 2.3. Skilled workers top the manufacturing labour force with about 46%, implying that close to half of the labour force within the Ghanaian manufacturing is highly skilled. However, less than 5% of the labour force is in professional or managerial positions. The distribution of the labour force in Ghana's manufacturing does reflect the lack of adequate managerial personnel in developing countries. Such low managerial skills in most firms in Africa pose as obstacles to the development of the private sector in the continent (OECD, 2007).

In comparison to the previous census in 1987, Table 2.4 shows that all subsectors of industry witnessed an increase in establishment size as well as persons engaged, except for mining and quarrying which saw a decline of about 33% in persons engaged. The largest growth occurred in manufacturing as size of manufacturing establishments grew by 212% and the growth of persons employed was about 55% as of 2003 compared to that of 1987 (see Table 2.4). As per figures of the 2003 period, manufacturing share of industry was a gargantuan 98% and the remaining being shared equally by the two other subsectors, electricity and water and mining and quarrying. In the same way, manufacturing constituted the major share of industry employment of 88%, followed by mining and quarrying, accounting for 7% whilst electricity and water recorded the least share of 4%. Indeed, the positive changes in industrial establishments (about 207%) as well as jobs (about 40%) created over the 1987 to 2003 period were mainly driven by the growth in manufacturing establishments and persons engaged. It is therefore evident that manufacturing continues to dominate the industrial sector in Ghana.

Table 2.4: A Comparison of Establishment and Persons Engaged in Industry (1987 and 2003) in Ghana.

Subsector	Establishment Size		% Share	% Change	Persons Engaged		% Share	% Change
	1987	2003	2003	03/87	1987	2003	2003	03/87
E & W	180	239	1%	33%	10,900	12,276	4%	13%
Manufacturing	8,350	26,088	98%	212%	157,100	243,516	88%	55%
M & Q	110	166	1%	51%	29,200	19,703	7%	-33%
All Industry	8,640	26,493	100%	207%	197,200	275,495	100%	40%

Source: Ghana Statistical Service (2005) Note: results are for phase 1 in each year.

Categorising the establishments based on the number of persons engaged, about 84% of manufacturing enterprises were found in establishments engaging 1 – 9 persons in phase two of the 2003 census (see Table 2.5). If this category of establishments were termed as micro, then it can be concluded that most manufacturing establishments in Ghana are micro enterprises, signifying the smallness of firms within the sector. In terms of employment, it also engages the highest number of workers of about 40%. However, it has the majority of unpaid workers of 66.3%. Thus, it presents a clear picture of the nature of micro enterprises in Ghana, which are mostly small, owned by individuals or families, and family members serve as the main source of labour but without regular or any official financial remunerations.

Table 2.5: Manufacturing Establishments by Size, Employees and Wages/Salaries, 2003, Ghana.

Enterprise Size	Total Enterprises		Total Workers Engaged		Unpaid Workers		Paid Workers		Wages and Salaries	
	No.	%	No.	%	No.	%	No.	%	¢(m)	%
≥ 30	517.0	2.2	84,774	38.2	5,686	5.4	79,088	67.7	1,376,853	83.3
20 – 29	535.0	2.3	12,658	5.7	5,431	5.2	7,227	6.2	37,880	2.3
10 – 19	2,742	11.5	35,742	16.1	24,298	23.1	11,444	9.8	137,463	8.3
1 – 9	20,004	84.0	88,778	40.0	69,764	66.3	19,014	16.3	100,872	6.1
Total	23,797	100.0	221,952	100.0	105,179	100	116,773	100	1,653,068	100.0

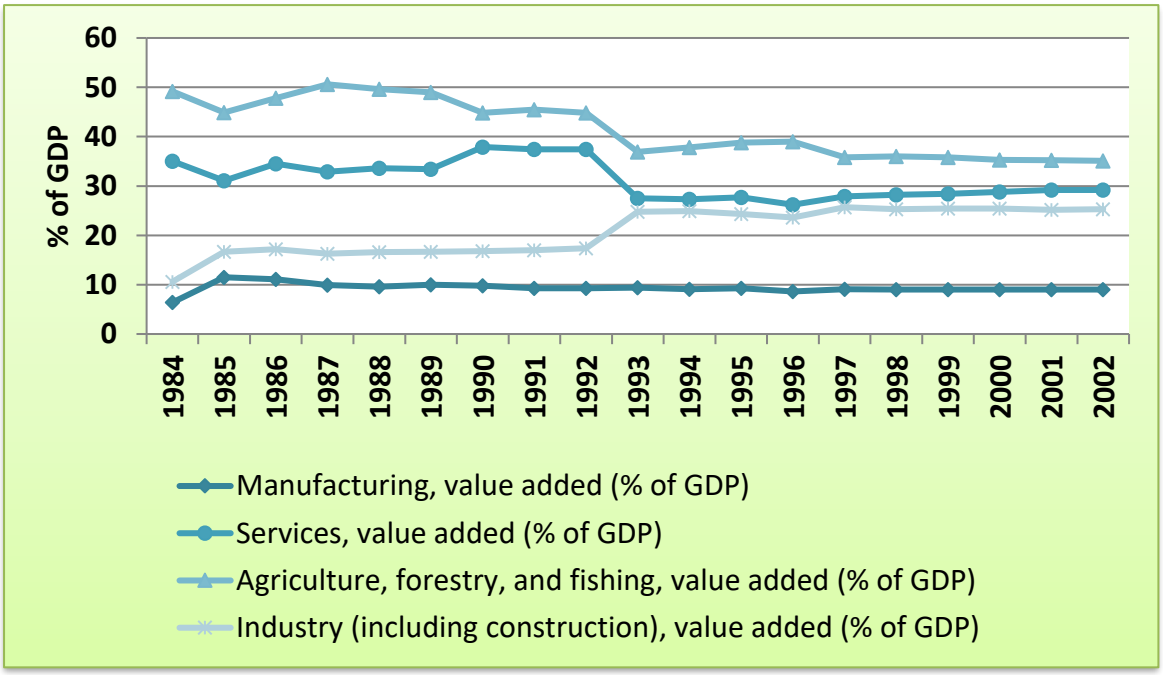
Source: Ghana Statistical Service (2006), 2003 National Industrial Census (Phase II).

On the other hand, Table 2.5 depicts that as small as 2.2% of manufacturing establishments were large enterprises, that is if establishments with 30 or more employees are classified as large. From Table 2.5, large enterprises are seen to employ about 38.2% of persons engaged in

manufacturing, the second largest employer after micro enterprises, but with the highest paid workers of 67.7% in the Ghanaian manufacturing subsector. This could be due to the fact that large firms "pay higher wages on average" (Francis and Honorati, 2016:1), probably as a form of incentive to attract and retain better workers. It is therefore not surprising that large manufacturing firms contribute about 83.3% of total wages within the Ghanaian manufacturing sector as shown in Table 2.6. All in all, the bulk of manufacturing establishments are micro (1 – 9), small (10 – 19) and medium (20 – 29) enterprises. Such enterprises account for roughly 62% of all manufacturing jobs, and responsible for a meagre 16% of total wages paid in Ghana's manufacturing subsector as shown in Table 2.5. The pattern of manufacturing employment adheres to the findings of Aga et al. (2015) and Ayyagari et al. (2014) that most jobs in low income economies are found in SMEs (Small and Medium Enterprises). On the other hand, paid employment is observed to be concentrated in larger enterprises as found also by Francis and Honorati (2016).

In Figure 2.8, manufacturing contribution to GDP in Ghana has been presented.

Figure 2.8: Contribution of Ghana's Manufacturing to Growth in Percentage of GDP, 1984– 2002.



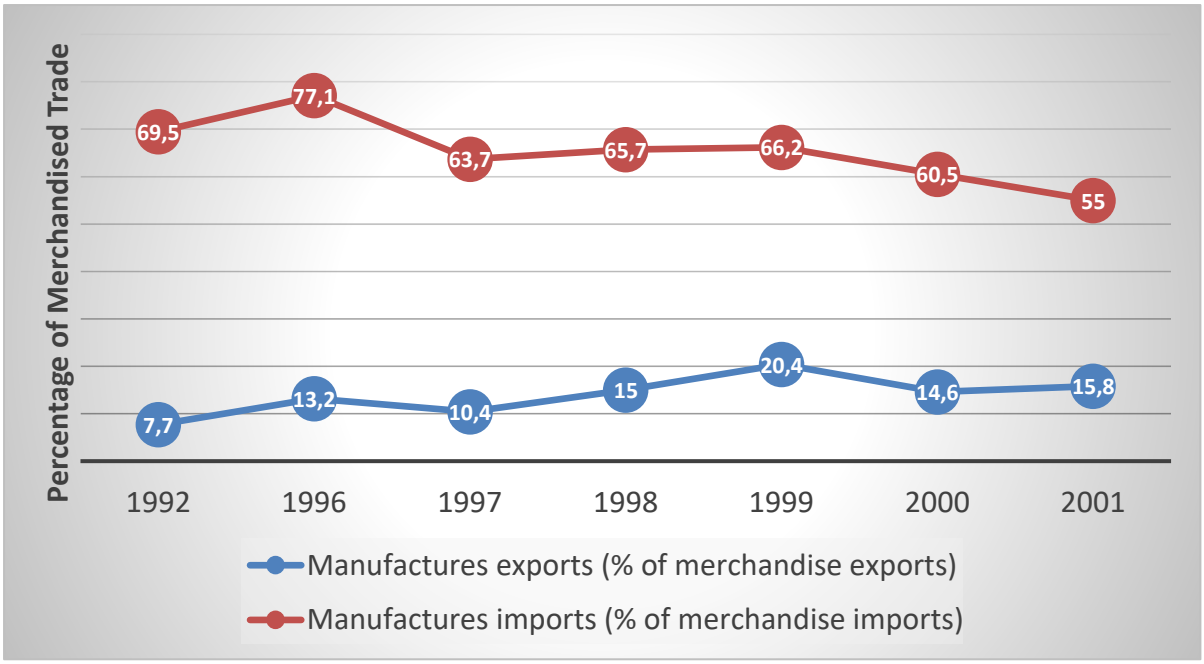
Source: World Bank (2018), World Development Indicators.

The picture as depicted in Figure 2.8 has however not been good. It can be seen from Figure 2.8 that manufacturing value added as a percentage of GDP stayed at about 10% over the 1984 to 2002 period. Therefore, in comparison to the other sectors, Ghana's industry of which manufacturing is the major contributor contributed less to the country's growth in the periods

reported in Figure 2.8. Subsequently, Figure 2.8 reveals that there has not been a structural change in favour of industry over the period considered.

The contribution of manufacturing trade to merchandised trade in Ghana over the 1991 – 2002 period is displayed in Figure 2.9. Manufacturing share of merchandised trade has been quite poor over the period considered. In particular, the share of manufacture imports to merchandized imports generally follows a declining trend. On the other hand, manufacture exports as a percentage of total merchandized exports is somewhat increasing even though it fluctuates. Nonetheless, over the period reported, manufacture imports share of merchandised imports trade has been above 50%, far more than that of manufacture exports. Therefore, imports of manufactures entail a greater proportion of the country's merchandized imports.

Figure 2.9: Ghana's Manufacturing Contribution to Merchandised Trade (1991 – 2002).



Source: World Bank (2018), World Development Indicators.

3. EVOLUTION AND RATIONALE FOR PRIVATE SECTOR DEVELOPMENT (PSD)

This chapter presents the debate on the different approaches purported to be the best means to drive the development of the private sector as evolved over time in development thinking. Additionally, the current chapter discusses the various arguments put forward in support of the need to develop the private sector and highlights the essence of the study focus by presenting the contributions of the Ghanaian private sector.

3.1 Evolution of Development Discourse on Private Sector Development

Several approaches to PSD have emerged since World War II, generating intense debates in the development cycle as to which approach is the best. Each approach has sought to identify how the private sector can be established and developed. Above all, key elements necessary for PSD have been enumerated with some approaches in favour of certain sectors deemed to be more productive and competitive, thus most beneficial. On the contrary, others argue for a level playing field for all, hence an all-inclusive approach. These approaches have been inspired by mainstream development thinking; hence, the discussions are situated within the broader development discourse. In the upcoming pages, we present the approaches together with their arguments in a chronological order, beginning with the structural approach, which ignored the role of the private sector. After which the neoliberal approach that took supremacy and marked the beginning of developing the private sector is explored. The section concludes with the neo-structural approach, to which priority has since shifted.

3.1.1 Structural Approach

Structuralism arose in the development discourse after World War II and became especially prominent in Latin America. It advocates structural change as an extremely important driver and result of economic development (Reiner and Staritz, 2013). That is, it emphasizes the need to transform a country's economy from subsistence agriculture to modern manufacturing on the basis that "the transition out-of-agriculture is a key aspect of economic development" (Teignier, 2018:45). In other words, sustained growth is seen to be underpinned by fundamental structural change (IMF, 2013), which requires a shift from largely agrarian economy to one based on services or industry. The main idea then, was modernization through industrialization with the state playing the role of developing key industrial sectors (Leiva, 2008). In the views of Stimson and Stough (2009:174), this was the time "national governments played an exceptionally active role in establishing national industries".

Per the structural approach, the creation of industries or modern manufacturing was to be backed by government interventions. The words of Rodrik (2004:1) clearly captures this approach: "Once upon a time, economists believed the developing world was full of market failures, and the only way in which poor countries could escape from their poverty traps was through forceful government interventions". Hence, the economy was said to be subordinate to politics (Leiva, 2008). Proponents of this school of thought believe that resources should be allocated by government and are therefore seen as skeptics of price mechanism (Jayanthakumaran, 2016).

Structural approach as a development strategy was also adopted by most post-colonial African countries, since it is rooted in the belief that third world countries can develop only with active roles of the state. This was because "Development was seen as something which could be purposefully managed and rationally planned, by the state and within the framework of the state" (Koponen, 2004:8). Thus, the approach lists the state as the core engine of development. It therefore emphasizes state-controlled planning and public enterprises. It favours protectionism through ISI, highlighting its preference for domestic enterprises (Küblböck and Staritz, 2013). In this regard, advocates of structuralism opine that richer countries benefit most from trade, implying an unequal distribution of trade gains (Jayanthakumaran, 2016). As a result, developing countries via the structural approach were to reduce dependency on the first world and rather pursue inward oriented development. Therefore, interactions with the global world were highly minimized under this approach in order to promote the growth of domestic economies that will be self-sustaining in the longer term.

Generally, the structural approach falls within the wider context of neoclassical and Keynesian economic discourse, which gained ascendancy, post-World War II. At the time, "Development was seen as an economic process but its main agent, or main vehicle, was to be the nation state" (Koponen, 2004:8). As such, most economic policies then were grounded on neoclassical economic theory and Keynesian theory (Stimson and Stough, 2009). As a result, development economists were very much involved in development planning and therefore served as advisers to world leaders. A leading name among this class of economists was John Maynard Keynes, who favoured government interventions in the promotion of investments (Willis, 2005). In the case of Ghana, Kwame Nkrumah, the first president, engaged the internationally renowned economist, Arthur Lewis as his economic advisor during post independent Ghana, in 1957. Structural approach to development lost out in the late 1970s due to its failure to cause the

industrialization of developing countries as well as improve their position in the global market. This gave rise to the emergence of the neoliberal approach in the early 1980s.

3.1.2 Neoliberal Approach

With the advent of the neoliberal approach, the state became a passive actor in development from its initial active role. It therefore marked the beginning of the private sector as a key instrument of development for reasons of government failure as described by Rodrik (2004:1) "… Then there came a time when economists started to believe government failure was by far the bigger evil, and that the best thing that government could do was to give up any pretense of steering the economy". Hence, a new world view, as Skildesky (2010) posits, was defined that believed in efficient and self-regulating markets. Therefore, much focus is on a free market, where government must refrain from direct involvement in economic activities. In other words, politics was deemed to be subordinate to the economy (Leiva, 2008). Neoliberals therefore argue that the costs of market failures are lower in comparison to costs associated with government interventions that are meant to remedy market failures (Reiner and Staritz, 2013). For instance, Skidelsky (2010: 100) opines that "free markets would deliver better results than fettered ones". Additionally, Harvey (2005) posits that poverty, be it on the domestic or worldwide stage will be eliminated when free markets and free trade are secured. Thus, it is believed that a free market is beneficial to all.

According to Harvey (2005:2), "neoliberalism is a theory of political economic practices that proposes that human well-being can best be advanced by liberating individual entrepreneurial freedoms and skills within an institutional framework characterized by strong private property rights, free markets, and free trade". The neoliberal approach therefore abhors state interventions, arguing that the private sector will develop better when it responds to the forces of the market, with the state guaranteeing a free competitive market and property rights (Küblböck and Staritz, 2013). Indeed, advocates of neoliberalism opine that private enterprises and entrepreneurial initiatives are the keys to innovation and wealth creation (Harvey, 2005). The role of the state was therefore to enforce contracts, maintain order and generally put in place conditions that allow markets to function (Leiva, 2008; Harvey, 2005). In that regard, the purpose of the approach was modernization through privatization, which meant shifting the engine of growth from the state to the private sector, marking its rise and significance in development.

As such, the main distinguishing feature of neoliberalism from neoclassical thinking and structuralism is its emphasis on free markets. Other key tenets of neoliberal thinking are the promotion of free trade, privatization and the elimination of government regulations and protectionism (Chant and McIlwaine, 2009). Thanks to the neoliberal school of thought, trade liberalization became prominent in the developing world. Indeed, the introduction of Structural Adjustment Programmes in developing countries in the 1980s, which entailed opening up, privatizing state-owned enterprises, and spearheaded by the World Bank and IMF was founded on neoliberal approach. It was on this basis, that the SAP was introduced in Ghana in 1983 together with the massive privatization of state enterprises. In fact, SAP was one of the main conditions for developing countries in order to access IMF and World Bank loans (Chant and McIlwaine, 2009). Another key virtue of neoliberalism is competition, which together with privatization and deregulation is said to "eliminate bureaucratic red tape, increase efficiency and productivity, improve quality and reduce costs" (Harvey, 2005:65). Crucial to competition however in the view of Harvey (2005) is the free mobility of capital across borders and sectors and the removal of any barriers such as tariffs that limit such mobility.

Neoliberal policies later came to be known as the Washington Consensus, a term coined by John Williamson in 1989 that captures policies advocated by the IMF and World Bank for developing countries, and relating to free trade, deregulation, privatization, floating exchange rates, etc. (Skidelsky, 2010). Neoliberal policies, favourable as they may be per the arguments of its proponents, have not been without criticisms though. Critics of neoliberal reforms believe that it rather succeeded in creating new forms of poverty and inequality as well as favoring wealthy and powerful countries and classes whilst neglecting the poor (Murray and Overton, 2011). Murray and Overton (2011) posit that the elimination of poverty was not an explicit concern of neoliberalism; rather the focus was to promote aggregate economic growth, which eventually will trickle down to the poor. Even though neoliberal thinking persists in the development discourse up to date, its failure to bring about high economic growth rates (Leiva, 2008) has caused some attention to shift to newer approaches such as neo-structuralism.

3.1.3 Neo-structural Approach

In recent times, the neo-structuralist approach has gained prominence in academia and development policy discourse. The concept of neo-structuralism "builds upon the legacy of structuralist analysis written in the 1950s, which was led in particular by Paul Prebisch" (Murray and Overton, 2011:309). Nevertheless, significant differences exist between structuralism and neo-structuralism as the prefix neo suggests. Neo-structuralism calls for the

transformation to an industrial sector driven economy from subsistence agriculture just like the structuralist approach but with a changing role of government. This approach talks about the existence of substantial market coordination and system failures and the need for government to shape the economy by introducing selective policies that favour certain sectors considered to be more productive (Amsden, 1992). It suggests that economic growth and development requires that productive factors are shifted through government policy from low-productivity to high-productivity activities to allow for learning, externalities and higher profits and wages (Reiner and Staritz, 2013). Even though neo-structural thinking diverges from a "blind neoliberal faith in the market" as Murray and Overton (2011:309) notes, it however shares the common goal of moving towards globalized modernity. Also, the neo-structural approach acknowledges the need for a business enabling environment but argues that, that alone is insufficient to bring about sustainable private sector and economic development. In other words, even though markets are central to the success of any economy, markets by themselves alone do not necessarily work well, and so government is needed in creating climates that make businesses thrive and create jobs, as well as providing infrastructure and ensuring the functioning of laws and regulations (Stiglitz, 2007).

Neo-structuralism therefore advocates selective interventions to correct the inherent market failures (Küblböck and Staritz, 2013), with the public sector playing a critical role of ensuring a healthy business environment that boosts private investments and business activity. This signals that both the public and private sectors will be most effective if they work together. In the same vein, public-private partnerships are encouraged with this approach. For instance, in Ghana, much attention is paid to public-private partnerships in recent times. As such, neo-structuralism can be a development theory that promotes a "mixed model of state direction and market accumulation" (Murray and Overton, 2011:308).

The term Latin American Neo-structuralism (LAN) as known in Latin America, it is understood that "Neo-structuralism makes it possible to fashion a new 'globalization with a human face'" (Leiva, 2008:5). The neo-structural idea is thus modernization through internationalization, whereby the state plays the role of increasing the competitiveness of exports (Leiva, 2008). This suggests that developing countries need to end their reliance on the exports of primary goods with low levels of processing, made by low wage labour, and rather focus on higher value-added exports. As Leiva (2008:4) notes, this requires that "social and political energies are focused in support of export drive and achieving dynamic entry into world economic flows". In addition, governments must create avenues for the skills of the labour

force to be upgraded, to match the capabilities and requirements needed for such a higher value-added export driven development.

The main tenets of neo-structuralism, especially as emerged in Latin America is expressed as:

> In terms of economic policies, neo-structuralists believe that without active export promotion policies, exports would tend to concentrate on a few firms and a few products vulnerable to fluctuations in international demand, trapping a country's exports in a tranche of raw materials with low levels of processing. Among policies considered in this area, neo-structuralists call for supporting technical innovation through partial subsidies and the promotion of strategic alliances between local and transnational firms, along with programs aimed at training the labour force and improving its skills through firm-specific training programs (Leiva, 2008:7).

Since the rise of neo-structuralism in Latin America, it has become prominent among center-left governments, "who have pedaled it as a viable alternative to the market orthodoxy of neoliberalism that is palatable to the voting public" (Murray and Overton, 2011:309). In general, the neo-structuralist approach corresponds to the consensus in development thinking: that the basic rationale for PSD is economic development which is argued to take place in the presence of economic growth; and that the private sector is needed to cause such growth, which can take place, only when government plays a key role to make the private sector flourish (Schulpen and Gibbon, 2002). In other words, economic growth is necessary for development, and sustainable growth can best be attained via the private sector, which needs to be promoted by policy makers. In effect, the combined roles of both government and the private sector are therefore essential determinants of development. On this backdrop, this study is broadly founded on the neo-structural approach and therefore attempts to analyze how government policies regarding trade reforms has propelled the performance of the Ghanaian private sector in the manufacturing industry.

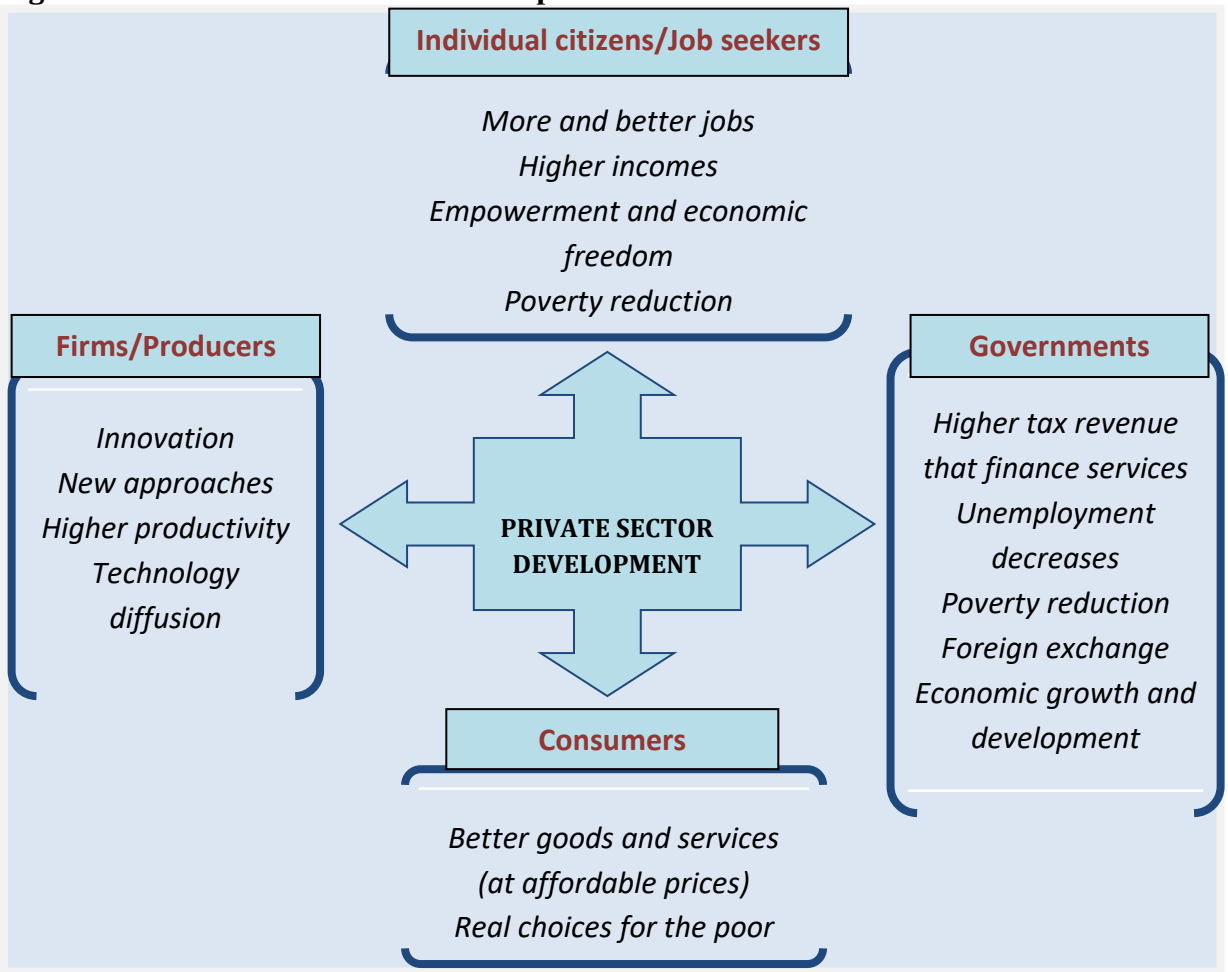
3.2 Rationale for Private Sector Development

To begin with, the private sector includes all economic activities of production not undertaken by the public sector. The sector is highly diverse, ranging from individuals to big multinational corporations that are engaged in different forms of activities at the local, national or international level either as part of the formal or informal sectors. Its potential to impact development in various ways is thus enormous. It is necessary however, to distinguish between private sector development and private sector in development. Private sector development has

the potential to cause and or deliver several social benefits as well as other positive externalities that stem from private sector led economic growth. On the other hand, private sector in development looks at the numerous ways private enterprises can engage in the development process such as serving as civil society actors in ensuring democracy and good governance. The development of the private sector is therefore a necessary condition that precedes the engagements of the private sector in development. This partly explains this study's focus on private sector development.

According to the DFID (2008), poor countries need stronger private sector development in order to generate jobs, increase tax revenues and reduce poverty. Therefore, the promotion of the private sector has been championed in recent times for various reasons as summarized in Figure 3.1.

Figure 3.1: What Private Sector Development Offers.



Source: Adopted from DFID (2008).

The need for PSD is discussed under the themes of economic growth and development, poverty reduction, innovation, employment and income generation, efficiency and domestic revenue

mobilization. In addition, Figure 3.1 shows that a developed private sector is beneficial not only to firms, but also to individual job seekers, consumers and the government. As a result, it offers a range of gains to a wide spectrum of actors in the society.

3.2.1 Economic Growth and Development via PSD

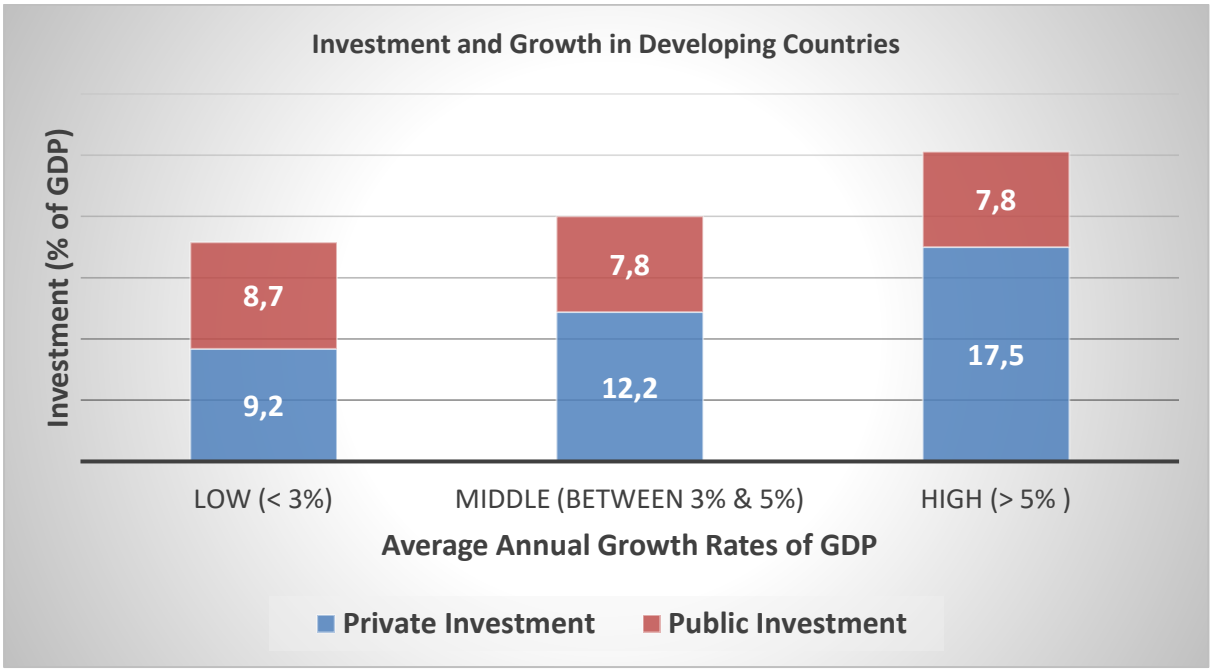
A major reason for the development and promotion of the private sector is its ability to deliver economic growth as reported in Figure 3.1. Wealth is generated through economic growth, which is a prerequisite for improvements in income and an increase in job prospects especially in developing countries. However, public sector initiatives alone cannot result in economic growth and development. As Sir Suma Chakrabarti (former permanent secretary of the UK's Department for International Development) rightly puts it, growth cannot be achieved without a vibrant, competitive and innovative private sector (Harvard EO Dialogue, 2007). Thus, the private sector has been recognized as the main engine of economic growth and worth developing. Hence, the development of the private sector is necessary in increasing the pace of growth. In the context of Africa, the African Development Bank believes that "the future of African economic growth – and the futures of millions of Africans and thousands of African communities – is closely tied to the private sector" (AfDB Group, 2013: IV). So far, the private sector in Africa contributes three-quarters of the continent's economic output (AfDB Group, 2013) and it's expected to be the main force that backs African economies.

Private business activity drives economic growth in both poor and rich countries. Thus, activities of private businesses are said to add value to a nation's resources through the introduction of new ideas and how best to combine such resources (Bonaglia and Fukasaku, 2007). This has the potential to increase the productive capacities of an economy. The OECD (2004:18) asserts that "the greater the capability of private actors, including the poor, to add value and create wealth, the faster will be the pace of growth". Indeed, empirical evidence from Bouton and Sumlinski (2000) alludes to the fact that private sector investments lead to growth. Put differently, there is a positive relationship between growth and private sector investment, hence, the need to develop the private sector. In other words, growth increases with higher private investments and vice versa.

Such private investments in the view of Pfeffermann (2000) often embody newer technologies and capital as compared to public investments, thereby playing a critical role in economic growth. This is evident in the growth witnessed by most developing countries after the 1990s, a period that saw an increase in private investments due to liberalization and market reforms in

the developing world, a period significant to this study. On the other hand, public investments declined during this period because of budget constraints and the privatization of state enterprises (Bouton and Sumlinski, 2000). Figure 3.2 depicts investments and growth using data from 50 developing countries as studied by Bouton and Sumlinski (2000) and shows a positive relation between private investments and growth. In Figure 3.2, countries that have had increased private investments, are observed to have witnessed higher average growth rates of more than 5% per annum. On the contrary, growth has been slower, less than 3% per annum for countries where private investment is minimal, suggesting that private investment is a key determinant of growth. Also, via competition and innovation of private enterprises, productivity is enhanced, which is a driver of economic growth. Furthermore, the development of the private sector is promoted not only for reasons of economic growth but also for social and economic development. This is because activities of the private sector create and sustain livelihoods as well as foster inclusive society.

Figure 3.2: Investment and Growth in Developing Countries, 1990 – 1998.



Source: Bouton and Sumlinski (2000).

3.2.2 Innovation and Employment Generation through PSD

The private sector serves as a long-term source of jobs and incomes for most people worldwide. Thus, a major foundation upon which the development of the private sector is supported is its ability to generate decent jobs and higher incomes. The logic is that increased and better employment opportunities via the private sector serve as a motivation for people to invest in their education and skills, thereby charting a promising path out of future poverty. This is

particularly relevant for African countries, where there is a persistent high level of unemployment especially among the youth, which make them vulnerable to be easily swayed into violent activities resulting into increased crime/violence, higher levels of poverty and political instability. This in turn can create a climate that is unattractive to businesses (Stiglitz, 2007), the rippling effects of which are disastrous to nation building. In other words, the social unrest and likely increase in crime due to unemployment can be minimized through the job avenues created by the private sector, making it critical to the development of a country.

In developing countries for instance, about 9 out of 10 jobs are said to be in the private sector (Kurokawa et al., 2008). In fact, most new jobs in these countries are created by the private sector (World Bank, 2002). Therefore, the private sector is an important avenue for the demand of higher skills levels and jobs. Pfeffermann (2000) posits that large-scale job creation in government and public enterprises is expected to decline in many developing and transition economies due to fiscal constraints and inefficiency of state enterprises. Consequently, the private sector is expected to provide more jobs coupled with better wages. To this end, the OECD (1995:6) opines that the "jobs and incomes created by private enterprises lead to a more equitable diffusion of the benefits of growth to more people". Nonetheless, this is achievable only with a developed private sector that can create highly competitive, profitable and growing private businesses.

Fundamental to development is technology generation and diffusion, which the private sector drives via competition, the absence of which stifles growth. The private sector also enables technology transfer in a competitive environment as other firms emulate the behaviour of highly successful firms to remain competitive. In the process, human capital is built and upgraded whilst productivity and incomes are enhanced and rise respectively. Through technological innovation and advancing it thereof, the private sector offers a variety of innovative products and services to both the poor and rich consumers, thereby expanding the choices available to them. So, the private sector is deemed to have the most efficient means in identifying and capitalizing on new technologies that boosts productivity. Therefore, the development of the private sector is promoted with the aim of bringing about innovation.

3.2.3 Poverty Reduction Effects of PSD

Furthermore, it is believed that a competitive private sector will empower the poor through the provision of better goods and services to them at very affordable prices (OECD, 2007). Therefore, competition is deemed as driving markets to serve the needs of the poor (OECD,

2004). Also, the development of the private sector is key in giving poor people opportunities to employments, thereby providing them with a source of income, subsequently taking them out of poverty. In developing countries for instance, most poor people are said to be engaged in the private sector, be it formal or informal (World Bank, 2002). According to Ravallion (2001), a 2% increase in household income resulted in about 7% decrease in poverty which is twice as much decline in poverty rates on the average. Then again, not only is the private sector key in helping reduce poverty in developing countries, it also aids in achieving the millennium development goals. This is rightly captured in the words of Matsumoto-Izadifar (2007), who says that the private sector is central in helping Sub-Saharan Africa attain the millennium development goals (MDGs) and recently the new SDGs, especially goals 1, 7, 8 and 9 which deal with, ending poverty, energy, economic growth, and infrastructure respectively.

Moreover, the poor themselves according to the World Bank study, Voices of the poor, have acknowledged that the private sector is "reasonably important to them and that private firms are quite effective" (Klein and Hadjimichael, 2003:2). It has been suggested that an inverse relationship exist between private investment and poverty reduction. Hence, poverty reduces as private investments increases. Furthermore, the pace and quality of economic growth brought about by a private sector led growth directly plays a major role in the reduction of poverty. In other words, the growth of the private sector leads to more growth to the entire economy, which is deemed as the biggest element in poverty reduction (World Bank, 2002). For instance, the OECD (2004) asserts that growth in GDP led to growth in the incomes of the poor in Ghana and resulted in a decrease in inequality between the poor and non-poor in the country.

3.2.4 Efficiency and Domestic Revenue Mobilization from PSD

A major underlying factor for the development of the private sector is the ability of private markets to allocate resources efficiently in a way that is beneficial to all levels of society; a target that state enterprises have often failed to achieve. It is believed that there is greater efficiency through private investments and initiatives. The OECD (1995) asserts that the combination of competition and market forces coupled with profit motivations of the private sector stimulates the better use of both human and material resources, thereby reducing resource depletion. To this end, the private sector is known to ensure the efficient flow of capital.

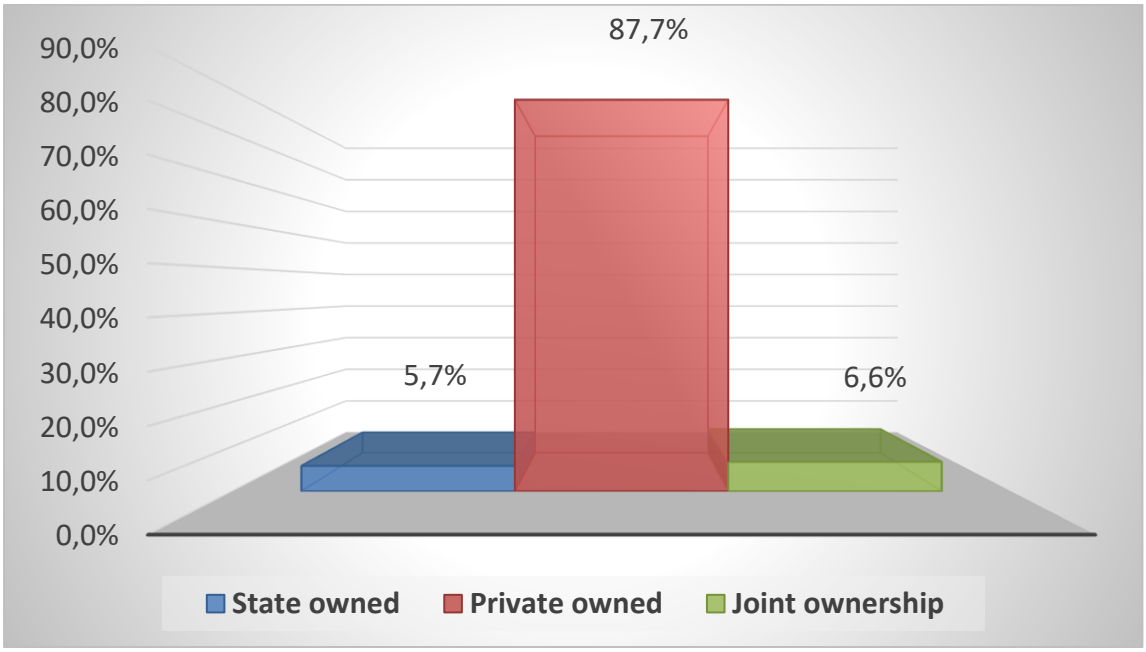
Then again, private companies are a key source of tax revenue for governments which is used for financing services. The existence of a vibrant, competitive, and growth induced private sector does serve as a sustainable means of financing government operations. Without such revenues, governments in developing countries are unable to provide public goods such as health, infrastructure, social safety nets and education to their citizenry. Also, the pace of growth that ensues due to the development of the private sector brings about higher and sustained revenue to governments which is needed for the provision of basic social amenities to the poor to enable them to live productive lives. In addition, the development of the private sector has been promoted in order to foster a broad and stable tax base which has the potential to contribute to improved governance, accountability and economic growth (Leo et al., 2012).

The above arguments on what PSD offer are well summarized in the statement of Mike Foster, member of parliament (MP) and Parliamentary Under-secretary of State for international development of the United Kingdom: "If we want people in developing countries to have the chance to get a job and earn a decent living, if we want parents to be able to provide for their children, if we want families to have access to affordable goods and services, and if we want to make poverty history for millions of people around the world – we need to put the private sector at the heart of the way we work" (DFID, 2008:1).

3.3 Contributions of the Private Sector in Ghana

The private sector in Ghana was championed due to the poor performance of state enterprises that failed to deliver the country's industrialization dream. Hence, the private sector was meant to revamp and revitalize the weak economy, create jobs and speed up the turn around to a sustainable economic development. In terms of job creation, the private sector has lived up to expectations, as it accounts for about 87.7% of jobs in Ghana's industry as shown in Figure 3.3. Figure 3.3 depicts that private sector employment in industry continues to outnumber that of the public sector. Industry has much less state involvement in terms of job creation, employing only about 5.7% in the sector. Joint ownership employs about 6.6% of person's in industry, about 1.3% more than state enterprises as shown in Figure 3.3. Perhaps efforts to promote Public-Private Partnerships (PPP) are yielding some good results. Private sector employment dominated the country's industrial employment as it contributed over 85% of jobs in industry based on the 2003 industrial census as shown in Figure 3.3.

Figure 3.3: Persons Engaged by Type of Ownership of Establishment in Ghana's Industry (2003).



Source: Ghana Statistical Service (2003), National Industrial Census, 2003 – Phase I Results.

State presence in the Ghanaian industry is mainly in the electricity and water subsector, where there is very little private participation and the state is the major employer as depicted in Table 3.1. From Table 3.1, state enterprises account for a miserable 1.2% of employment in manufacturing with another smaller percentage (about 4.1%) accounted for by joint state and private establishments. In contrast, as many as 94.7% persons are engaged in the private manufacturing sector, making the private sector the main job creator in the Ghanaian manufacturing sector, hence one of the key reasons for focusing on the Ghanaian private sector operations in the manufacturing sector in this study. In general, employment in the Ghanaian industry is dominated by the private sector, accounting for 87.7% of jobs, with the remaining 12.3% found in the state and joint ownership establishments (see Table 3.1).

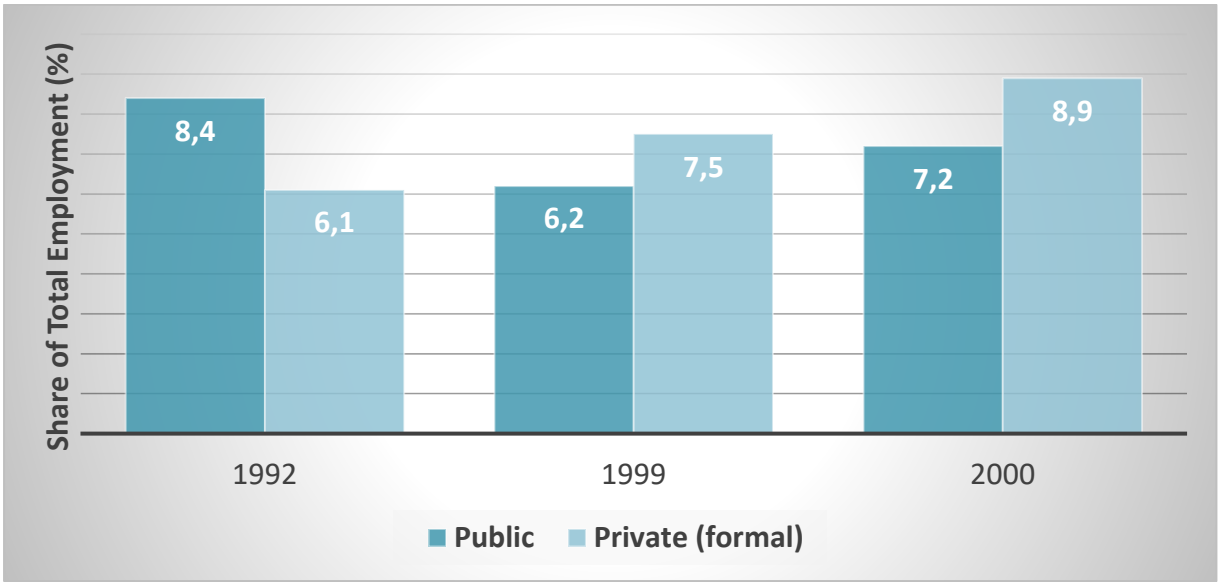
Table 3.1: Persons Engaged by Industry Major Division and Type of Ownership, 2003.

Type of Ownership	Manufacturing		Mining and Quarrying		Electricity and Water		Total	
	Number	%	Number	%	Number	%	Number	%
State Owned	2,912	1.2	906	4.6	11,938	97.2	15,756	5.7
Private Owned	230,512	94.7	10,793	54.8	240	2.0	241,545	87.7
Joint Ownership	10,092	4.1	8,004	40.6	98	0.8	18,194	6.6
Total	243,516	100.0	19,703	100.0	12,276	100.0	275,495	100.0

Source: Ghana Statistical Service (2006), National Industrial Census, 2003 – Phase I Results.

It can be seen from Figure 3.4 that private formal employment has witnessed an increasing trend between 1984 and 2000 whilst the opposite is the case with public sector jobs. This supports the argument/expectations that jobs generated by states in developing countries are expected to drop whilst highlighting the increasing role of the private sector in job creation.

Figure 3.4: Private and Public-Sector Share of Employment in Ghana (1992 – 2000).



Source: Data taken from Aryeetey and Baah-Boateng (2015).

Not only is the private sector dominant in job creation, but also, earnings in the Ghanaian private sector have been relatively higher than that of the public sector as displayed in Table 3.2. Table 3.2 shows that average monthly earnings in the private sector was about 63.7% higher than monthly earnings in government jobs as of December 2000 and as much as 83.8% higher by the end of 2002. This suggests that a vibrant private sector has the potential to increase the incomes of people employed in that sector and by extension their standard of living.

Table 3.2: Average Monthly Earnings per Employee (Government and Private), December 2000 - 2002.

	Dec. 2000	Dec. 2001	Dec. 2002
Government (¢ per month)	333,924	545,825	796,675
Private Sector (¢ per month)	524,603	722,301	950,306
Minimum Wage (¢ per month)	4,200	5,500	7,150
Ratio of government to private sector wages (%)	63.7	75.6	83.8

Source: Bank of Ghana (2007).

Considering the contributions of the private sector to PSD in Ghana as discussed above, coupled with and the critical role that PSD is generally envisaged to play, it is necessary to have a well-functioning private sector and to pay attention to the performance of the sector, since it serves as the means to the sustainable development of the country. It is therefore worth delving deeper into the response of the private sector to the liberalization of trade in Ghana that began with the structural adjustment and economic recovery programmes.

With the shift to the private sector led growth since the inception of the ERP in 1983 accompanied by the changing roles of the state and market mechanism, it is expected to create an enabling environment for the private sector to thrive. However, very little has been done to assess the impact of such a change. It is thus worth researching on the sector especially with the ever-growing calls to continue to assist the sector grow and cause the modernization of the country. More so, the adjustment programme which ushered in the focus and growing importance of the private sector has been touted as a success story in Africa by both the World Bank, IMF and aid donors (Herbst, 1993; Loxley, 1990). Furthermore, trade liberalization was pursued to boost the performance of the private sector via easy access to imported raw materials – key inputs to their production that they were initially starved of. It is therefore prudent to analyze how such an enabling environment coupled with other policy reforms have shaped the private sector in its bid as a main engine of the industrialization needed to cause the development of the country via an evaluation of the trade effects of liberalization at the firm level.

4 THEORETICAL FRAMEWORK AND EMPIRICAL LITERATURE REVIEW

This chapter examines the theories underpinning the current study upon which the hypotheses are derived. It therefore provides the relevant theories that explain the study hypotheses. First, it presents the arguments on trade liberalization, after which the channels through which gains via trade come about are discussed. The chapter goes on to describe the well-known theories underlying the relationship between trade liberalization and firm performance. Specifically, the nexus between tariffs and productivity as well as profitability are discussed. It then continues with a review of previous studies on trade liberalization and firm performance, starting with research on trade and firm productivity, and then to trade and firm profitability. The studies focusing on Africa are first presented and followed by other studies worldwide although not much evidence of these relationships exists in the African context.

4.1 Arguments on Trade Liberalization

Trade liberalization can be said to be the removal or reduction of restrictions or barriers to the free flow of goods between countries. This includes the removal or reduction of both tariff and non-tariff barriers to trade. A tariff is a tax on imported goods and can either be specific or ad valorem. Whilst specific taxes are levied as a fixed charge for a unit of good imported, ad valorem tariff on the other hand, are taxes that are levied as a percentage of the value of imported goods. Most trade policies have been in the form of tariffs and therefore trade liberalization is geared towards freer trade through the reduction of tariffs and other barriers to trade. However, the debate on trade liberalization has been mixed: on the one hand, protectionists argue against liberalizing trade with the belief that it is detrimental to the growth of domestic firms. On the contrary, free traders' favour trade liberalization on reasons mainly centered on economic welfare gains, economic growth and development through specialization, economies of scale and competition.

Developing countries until the 1980s adopted import substitution strategy as the means to industrialization. Edwards (1993) asserts that such a strategy was based on the thinking of Prebisch (1950) and Singer (1950). This strategy was supported by protectionists' who argued that inward looking development policies were good for self-reliance of developing countries and for them to control their own destiny. It is opined that between the 1950s and 1970s, "a large number of development economists embraced the protectionist view, and devoted enormous energy to design planning models that relied heavily on the import substitution ideas" (Edwards, 1993:1359). The aim of protection is to improve the position of domestic producers in comparison to their foreign counterparts. This is achieved through policies put in

place to deliver one or more of the following: a) increase home market price of foreign products, b) decrease the cost of domestic producers and c) limit access of foreign producers to the home market (Coughlin et al., 2000). As a result, import substitution also known as inward-oriented strategy is "biased in favour of domestic production and against foreign trade" (Le et al., 2016:40).

It was also argued that protectionism is a means for developing countries to evolve their own styles of development. This, according to protectionists will result in the achievement of greater domestic industrial diversification in developing countries. Hence, they proposed that low income countries first substitute domestic production of consumer goods that were initially imported, known as first stage import substitution, and then substitute domestic production for sophisticated manufactured goods using high tariffs and quotas in the second stage (Todaro and Smith, 2003). On that basis, agricultural self-sufficiency was to be first achieved before the shift to secondary inward-looking policies of manufactured commodity self-sufficiency. These policies, according to the protectionists, encourage indigenous manufacturing and development of indigenous technologies that are in line with a country's resources. This assertion is supported by a model of Helpman and Krugman (1989) which indicates that tariffs cause a shift in the location of production from foreign to home markets as there are no shipping charges associated with home producers, thereby offering lower prices to domestic consumers. According to them, the imposition of a tariff lowers the price index faced by home consumers but raises that of foreign consumers such that the protected market becomes a favoured place to produce, thereby raising home welfare. However, they argue that this is only possible in the presence of large transportation costs coupled with large-scale economies.

Import substitution was also favored due to the infant industry argument and protection against dumping. It was argued that domestic firms did not have the capacities to compete with foreign firms and products and ended up winding up amidst such competition. That is to say, trade liberalization results in the exit of domestic firms as suggested by Tybout (2003). In other words, import competition compel some domestic firms to cut down on their production and by extension, a reduction in employment (Busse and Groβmann, 2007). It was also asserted that opening up an economy may lead to the closing down of the import competing industry as imports could completely replace domestic output (Corden, 1967). For this reason, Corden (1967) argues that a certain level of tariff is needed to establish the domestic industry. Hence, to protect them and save jobs, there was the need to put limitations on the flow of foreign goods to home markets and to ultimately enable the development of comparative advantage in

domestic sectors that will allow them to compete on the international front. Thus, learning over time via trade restrictions will result in a fall in production cost to match up with international standards. The need for and gains from the infant industry protection is summed up in the words of Suranovic (2010:627) "All together, the infant industry protection may cause a substantial increase in the growth of the gross domestic product (GDP) relative to what might have occurred otherwise and thus act to improve national welfare".

Domestic consumers and producers were also protected from dumping with import substitution strategies. Dumping is defined simply as price discrimination between national markets. However, an alternative definition of the concept in popular usage is "export sales at a price below the cost of production" (Ethier, 1982:489). This provides the case clearly of using protection to counter dumping. Thus, dumping takes place when countries with excess stock sell them at lower cost on the global markets, which has the potential to make other producers become unprofitable. There are also concerns that inferior goods are dumped on least developed countries with open trade which can pose a health threat to consumers. Other arguments in favour of protectionism are that of fiscal revenue and the redistribution of income from the export sector to the protected sector. Itis generally assumed to be much easier to collect tariffs in most developing countries than income taxes since imported goods cross a border which makes it difficult to hide them. Therefore, governments can generate much revenue from the imposition of tariffs as compared to other forms of taxes. Protection was also used by developing countries to redistribute income. Coughlin et al. (2000) posit that the distribution of income is affected by protectionist policies such that disadvantaged groups are favoured.

Further arguments for protectionism relate to the terms-of-trade and strategic trade policy. The terms-of-trade argument pertains to the cost and benefit analysis of the imposition of tariffs. It is thus the net welfare effect of a tariff on the imposing country. Helpman and Krugman (1989) assert that a small tariff benefits the home country in the form of an improvement in the terms of trade in the case of a large country. On the other hand, the strategic trade policy argument has to do with subsidies to domestic firms. In other words, national incentives by governments are said to allow for the capturing of a larger domestic share of internationally profitable industries (Spencer and Brander, 1983). It is an argument first put forward by Spencer and Brander, who believe that governments that aim at maximizing net welfare has an incentive to introduce subsidies. It is postulated that policies of governments can alter the terms of competition such that domestic firms are favoured over foreign ones and cause a shift in excess

returns in monopolistic markets to domestic firms (Coughlin et al., 2000). The concept has since received wide attention from other authors[12].

Finally, there is a political economy justification for the imposition of tariffs. This involves the lobbying activities of industries or individuals in the import competing sectors that do not want to be exposed to international competition and therefore wish to be protected against such competition in order to enjoy monopolistic profits. Hence, they push strongly for protectionism as it creates domestic monopoly. Such people who want trade limited are said to be more effective politically than those who wish to have trade extended (Krugman et al., 2015).

After decades of protectionism in developing countries, the evidence shows less success in the desired outcomes. For instance, Rodrik (1988) posits that high levels of protection in developing countries stimulated inefficient levels of production. Also, a stagnation of production over a long period ensued for protected sectors that did initially develop via protection but needed continued government intervention to stay in the market. So, their competitiveness in the international market and the comparative advantage that temporary protection was meant to develop never materialized. This is rightly captured in the words of Rodrik that there is "the possibility that in certain sectors the initial protection and its eventual removal may both prove harmful" (Rodrik, 1988:133). Most developing countries could not also benefit from the terms-of-trade gains due to their inability to affect foreign prices by virtue of their smallness.

As a result, most developing countries opened up their economies to foreign trade in the early 1980s. The return to outward oriented economies by developing countries was largely supported by the World Bank and IMF. An outward- oriented trade policy, also known as the export promotion strategy, has "no discrimination in favour of exports promotion or against import substitution" (Le et al., 2016:40). Rather, there exist equal incentives to export as well as import as opined by Le et al. (2016) under such a strategy. According to the IMF (2011:1), opening up trade has been a key factor in the economic success of East Asia that have over the past 20 years reduced import tariffs from 30% to 10%. They posit that "no country in recent decades has achieved economic success, in terms of substantial increases in living standards for its people, without being open to the rest of the world". Consequently, they assert that policies in favour of open trade and investment are needed for sustained economic growth. This

[12] See Helpman and Krugman (1989) for specific examples of the concept.

assertion is supported by Corden (1967), who postulates that opening up an economy may lead to increased output in the import competing industry and squeezing of its monopoly profits.

Such a move by the developing world is also in line with free traders who advocate outward looking export promotion strategies as the means to the rapid industrialization of developing countries. They argue that there are gains from international trade and that such gains are mutually beneficial irrespective of the productive efficiencies of countries. These gains, they believe, result from the better use of resources via specialization (comparative advantage) and economies of scale. With trade liberalization, it is argued that countries are able to specialize in the production of goods and services that they can produce at the lowest opportunity costs. This specialization can arise from either difference in technology (Ricardian model) and or factor endowments (Heckscher-Ohlin model) and can cause net gains in economic welfare. Also, firms are able to produce on a larger scale via specialization to meet the demands of the larger market created through openness to international trade. Therefore, they are able to produce at a more efficient level of production and save cost via economies of scale as the market size for firms is enlarged (Mendoza, 2010). Subsequently, lower prices for consumers and greater efficiency for exporters is achieved. It can also lead to an increase in firm profits which could be an incentive to innovate and reap the benefits thereof.

Countries also benefit from such policies via competition, lower prices and the abolition of price distortions and cost effects of protectionism. Foreign competition spurs domestic firms to increase their efficiency to stay competitive as well as cut costs to be able to charge competitive prices. It thus serves as an incentive for firms to innovate, which is a driver of economic growth (Aghion et al., 2001; Aghion et al., 1997). Such competition also prevents domestic monopolies from charging too high prices, hence offering consumers lower prices and an increased access to a variety of goods and services. Love and Lattimore (2009) put forth the argument that trade restrictions in the form of tariffs make products more expensive to consumers and at the same time hamper demand for imports. They opine that tariffs have the potential to alter relative prices of products and can protect uncompetitive companies and their overpriced products. Owing to that, they favour open trade as they believe it will result in welfare benefits that far outweighs the costs associated with it and must therefore be encouraged especially in developing countries.

Evidence further suggests that countries that are outward looking tend to grow faster than inward looking economies. In this regard, Dollar (2001) asserts that developing countries

which reduced their tariffs sharply in the 1980s, on average grew much faster in the 1990s than those that did not. According to him, countries such as India, Vietnam and Uganda that recently opened up their economies have experienced rapid growth and poverty reduction. Therefore, the benefits of trade liberalization have been said to exceed its costs (Love and Lattimore, 2009; Matusz and Tarr, 1999), and subsequently considered the preferred path to industrialization and sustainable development.

4.2 Channels of Gains to Domestic Firms via Trade

Per the current literature, there are four key mechanisms through which trade liberalization affect firm performance. These are: a) competition effect, b) access to greater variety effect c) quality of inputs effect, and d) learning effect. These effects are discussed in detail in the upcoming sections.

4.2.1 Competition Effect

The oldest insight in the field of trade policy is the phenomenon that international trade increases competition (Helpman and Krugman, 1989) and often referred to as the competition effect. Through international trade, domestic firms are said to be exposed to tougher and higher competition that drives them to be productive, innovative and efficient. For instance, Busse and Groβmann (2007) assert that increased competition for domestic firms due to trade liberalization via the purchase of cheap investment and intermediate goods results in increased production and employment. Additionally, Mendoza (2010) opines that exposure of a country's producers to competition induces them to generate new ideas and technologies that allow them to remain competitive as well as alleviate the duplication of research effort. Thus, trade liberalization results in pro-competitive effects through reduced prices and markups that can lead to firm selection and increased innovation (Impullitti and Licandro, 2013). This in turn generates further benefits such as greater use of new technology, better resource allocation, deepening specialization, technology transfer between countries and lower prices through economies of scale. Thus, increased foreign competition has the potential to cause with-in industry resource reallocation as opined by Melitz (2003) as well as improve within firm productivity in the views of Bernard et al. (2011), Aghion et al. (2005) and Helpman and Krugman (1985).

In their import-competing monopolist model, Helpman and Krugman (1989) postulate that actual or potential competition from imports limits domestic monopoly power. They argue that protection creates market power, that otherwise will not exist. Therefore, the presence or threat of competition from imports prevents domestic firms from freely choosing their profit

maximizing price along their marginal revenues, thereby making them behave as perfect competitors.

Levinsohn (1993) refers to this competition effect as the imports-as-market-discipline hypothesis. Using a model of imperfect competition and the concept of price-marginal costs markups, he assessed the import liberalization programme introduced in 1984 in Turkey with firm-level manufacturing data spanning from 1983 – 1986. Levinsohn's hypothesis indeed did confirm that international trade increases competition as reflected in the decline in the price-marginal cost markups in the industries that experienced decreased protection after liberalization. A later model by Krishna and Mitra (1998) that incorporated the assumption of changing returns to scale and applied to Indian micro-data did also depict an increase in competition via international trade.

A recent model that offers a comprehensive approach for analyzing the competition effect of trade liberalization is that of Impullitti and Licandro (2013). Based on industry dynamics with firm heterogeneity, oligopolistic competition, and cost-reducing innovation, their model assumes the production of both a homogeneous good under constant returns and a differentiated good with a continuum of varieties, each of which faces variable and fixed costs of production. They first set up a simple version of their model under the assumption of each variety of the differentiated product being manufactured by a fixed number of oligopolistic producers at no fixed export costs (i.e. all firms export). After which they introduce sunk entry cost and fixed cost of exports (where not all firms export) to produce a general version of the model. Their model indicates that the presence and operation of foreign firms in domestic markets through trade liberalization leads to increase in product market competition by reducing markups in the differentiated sector. Subsequently, market efficiency is increased resulting into an expansion of production quantities by the oligopolistic firms. They also decomposed the gains into direct and indirect competition effects, where the former emanates from the trade induced increase in firm size that raises the incentive to innovate as innovation is cost reducing. On the other hand, the decrease in markups is said to force least productive firms to exit, prompting a reallocation of resources to the surviving productive firms, thereby increasing not only average productivity but also innovation. This trade-induced firm selection is said to ultimately affect the productivity growth rate and termed the indirect competition effect of trade liberalization.

4.2.2 Variety and Quality Effects

Even though Baldwin and Forslid (2010) found an anti-variety effect due to trade liberalization, nonetheless, high tariffs have been said to not only limit quantity but also the range of goods that can be imported (Goldberg et al., 2010). Accordingly, trade liberalization is deemed to bring about an increase in access to greater variety of goods and services for domestic producers, thereby promoting international knowledge spillovers. Thus, domestic firms via international trade benefit from R & D of foreign firms by having access to improved technology via a variety of new intermediate inputs imports. Through increased access to a wide range of imported intermediate inputs or new product variety, domestic firms are able to improve their efficiency. This is known as 'the variety effect' of trade liberalization.

The seminal work of Feenstra (1994) provides a methodology that allows for the quantification of such an effect. In his approach, exact import price index of a single imported product and extensive margins of imports are employed whilst admitting the Armington (1969) variety definition that every country export exactly one single variety per product category. He then decomposed variety gains in terms of countries of origin and product categories. Measuring variety based on the number of countries a given product is imported from, Klenow and Rodriguez-Clare (1997) assessed variety effect of trade liberalization with data from Costa Rica and concluded that higher tariffs and smaller markets limit variety. This implies that free trade or lower tariffs increase access to both larger markets and product varieties, which impacts on welfare. Their model results are in line with that of Broda and Weinstein (2006) who applied Feenstra´s method to US data and found that globalization impacted substantially on welfare through the imports of new varieties. Their findings also indicate a large effect of new goods and variety on the American economy. However, they identified two key drawbacks of Feenstra´s approach that prevented its wide use by researchers as: 1) the value of the introduction of completely new product categories cannot be assessed with Feenstra's index and 2) a large number of elasticities that take on imaginary values that are hard to interpret tend to be generated via Feenstra's method. Hence, they developed upon it to allow for the computation of an aggregate import price index.

Applying the methodology of Feenstra (1994) together with the monopolistic competition model of Krugman (1980), Mohler (2009) extended the approaches of both Feenstra (1994) and Broda and Weinstein (2006) by proposing a lower and upper bound to the aggregate import price index under the assumption of a low and high growth at the extensive margin of imports. His results from both bounds confirm the earlier assertions that there are variety gains from

trade. The model of Goldberg et al. (2010) also revealed that lower tariffs via India´s trade liberalization in the 1990s resulted in increased access to new varieties imports especially in intermediate products using the import price index as found in Feenstra (1994) and a variety index.

Furthermore**,** it is argued that imports from richer countries tend to have higher quality as compared to those of low-wage countries (Schott, 2004). Using unit values of product level US imports, Schott (2004) concluded that high-wage countries make use of their endowment advantage to add features or quality to their varieties which are non-existent in the varieties of low-wage countries. Hence, international trade does allow for an increased access to such higher quality intermediate inputs and outputs that help local firms improve their productivity, and therefore termed 'the quality effect' of trade liberalization. Evidence from Schor (2004) supports this argument. Employing the procedures of Olley and Pakes (1996) and Levinsohn and Petrin (2003) to data from Brazilian manufacturing firms, she indicates that trade liberalization in Brazil led to a new access to foreign inputs with better technology, which resulted in productivity gains for domestic firms.

Kugler and Verhogen (2009) postulate that importers pay higher prices for imported inputs than they pay for similar varieties found in the domestic markets. As such importers tend to be more productive plants that purchase higher quality inputs, implicitly implying that higher prices correspond to higher quality. Other studies (Fan et al., 2015; Manova and Zhang, 2012) employing higher prices of imported inputs as proxy for high quality have also concluded that plants that pay higher for inputs, charge higher prices for their exports and are able to also export more. However, Edwards et al. (2016) assert that the measurement of quality has been quite difficult due to data constraints as prices of imported inputs have been approximated by unit values since they are often not observed.

4.2.3 Learning Effect

Finally, it is asserted that countries that participate in the world market learn a great deal about innovative products as well as novel methods being used in the production of older goods (Grossman and Helpman, 1991). Learning effect thus arises via the foreign technology that is embodied in the imports from more advanced countries that small economies access because of trade liberalization and in the process, learn from such foreign technology and knowledge. Hence, referred to as learning by importing. The words of Grossman and Helpman (1991:238) rightly captures this; "at the least participation in world markets would seem to accelerate

greatly a country's acquisition of foreign knowledge". It is therefore argued that opening up to trade is a primary avenue for the diffusion and adoption of new technologies, which is said to be a key source of productivity and economic growth especially in developing countries (Kasahara and Rodrigue, 2008).

The classic paper of Arrow (1962) presents learning by doing model that indicates that as firms engage in new activities, knowledge is accumulated. Hence, defining learning simply as the acquisition of knowledge, which he opines as underlying the production function. Although he concludes that learning does not take place through the use of a finished capital good, Grossman and Helpman (1991) posit that during the manufacturing of capital goods, firms generate additions to knowledge that cannot be prevented from flowing into the public domain. Hence, they assert that firms that access such manufactured capital goods acquire free knowledge that contributes to their productivity in subsequent manufacturing. Another aspect of the learning effect relates to knowledge spill over through imitation and knowledge transfer via export-oriented foreign direct investment. Aside differences in natural resource endowments across countries, it is also argued that different countries at similar points in time have different production functions (Arrow, 1962). On that account, less developed countries are able to replicate later, imported products that have initially been produced by advanced countries. Accordingly, Mendoza (2010) postulates that whom a country trades with matters since the potential and scope for learning is higher with trading partners that are technologically advanced.

Unlike Arrow (1962), Mendoza (2010) developed a model of trade-induced learning where both domestic and cross-border learning externalities could spur growth or shape the industrialization strategy of developing countries through trade. Thus, he develops upon learning by doing to generate a trade-induced learning model. Assuming a small open economy where learning by doing and trade-induced learning underpin the engine of growth, the model is based on a two country - two sector and one factor (labour) approach. The two countries are said to be distinct in that one is large and technologically advanced and the other small and technologically backward. In the same way, the world is made up of a traditional sector (agriculture) that engages in primary goods production and a non-traditional sector (manufacturing) involved with the manufacture of higher value added and higher productivity. Labour, the only factor, is said to be mobile within but not across the two jurisdictions. He begins with learning by doing model within a country by generating two production functions in each jurisdiction for both manufacturing and agriculture. However, arguing that learning

does not only occur within a country but also between trading partners, he modifies his learning model to capture the trade-induced effects. Such effects, he posits emanates from knowledge spillovers through imitation, importation of high-technology intermediates and vertical integration of production across countries. Hence, by characterizing the small country learning such that its output is linked not only to its own but also that of its trading partners, he arrives at the trade/induce model in that productivity of the manufacturing sector is dependent on both internal and external manufacturing output levels.

His trade-induced model brings to light three propositions that capture the various forms of learning that firms achieve via international trade. These are: first, that trading matters, since firms could increase their productivity through export (also known as learning by exporting) and import linkages with buyers and suppliers; Secondly, that the trading partners highly matter as trade-induced learning is higher from trade with richer and technologically advanced countries, and finally, that the type of traded products matters as intensive learning is associated with either more sophisticated exports with greater variety or imports of R & D intensive capital goods.

4.3 Theoretical Framework

To promote and encourage domestic processing, create jobs as well as increase domestic production, most countries have either none or lower tariffs on imported inputs. This is partly meant to increase access of domestic firms to quality inputs needed to produce competitive products. It has been argued that imported inputs result in higher productivity through technology transfer and knowledge spill over (Yasar, 2013). Also, Amiti and Konings (2007) posits that lower input tariffs can raise productivity not only through learning, but also via variety, and quality effects. They argue that increased access to imported inputs through low input tariffs increases domestic firms' access to a variety of inputs that are of higher quality. This is consistent with the theoretical models of (Xie, 1999; Grossman and Helpman, 1991; Markusen, 1989; Ethier, 1979), which suggest that there are gains from free trade. Several empirical studies which are discussed later support these arguments.

Similarly, highly profitable firms are said to be more productive as they make huge investments and vice versa. Hence, "neoclassical theory argues that large firms would be more profitable than smaller firms" (Coban, 2014:74). Peltonen et al. (2008) argue that firm profitability can be affected by imports in two opposing ways. On the one hand, imports can result in pro-competitive effects on the domestic market, known as the market discipline effect which can

lead to lower market power of companies and a decline in firms' mark-ups and profitability. This effect is however said to be dependent on the substitutability between domestic products and imported goods. On the other hand, imports can also result in access to cheaper imported inputs which can result in pro-competitiveness effects for companies using foreign intermediates as inputs or those that resell imported final goods, hence leading to higher profits. Therefore, imports can have both positive and negative effects on a firm's profitability. Nevertheless, the total effect of imports on firm profitability is expected to be positive. They believe that the overall effect is influenced by the origins of imports, the domestic market and the industries.

4.3.1 Theoretical Model of Productivity and Profitability Effects of Trade

The Melitz (2003) model, developed by Marc J. Melitz incorporates firm productivity heterogeneity into Krugman's model of trade under monopolistic competition and increasing returns. Thus, it can be said to be an extension of the Krugman (1980) trade model that acknowledges productivity differences among firms. However, it is fundamentally based on the dynamic industry model of Hopenhayn (1992a, 1992b) and formulated within a general equilibrium setting. It is therefore a dynamic industry model in the presence of heterogeneous firms with different productivity levels that analyses how international trade impacts intra-industry performance such as productivity and profitability (key importance to this study). The logic behind the model is that exposure to trade causes the more productive firms to enter the export market whilst the less productive firms continue to operate only in the domestic market. Subsequently, the least productive firms exit and the productive firms into exports make gains, which both lead to a reallocation of market shares to the most productive firms and resulting in increases in productivity and profits. It has been widely applied in a number of studies and "deemed to be able to reproduce many of the most salient patterns emphasized by recent micro-level studies related to trade" (Melitz, 2003:1695).

An advantage of the model is that it captures firm heterogeneity into a trade model and allows for a single but sufficient statistic (average firm productivity level) to capture the distribution of productivity levels for aggregate outcomes. Additionally, a long run analysis of trade effects on firm performance with different firm level productivity can be carried out with this model. On the other hand, there are some limitations associated with some of the basics that underpins the model. First, the simplicity with which the firm productivity dynamics is modelled in Hopenhayn (1992a) poses a challenge. Also, a concession is that related to the Dixit and Stiglitz (1977) monopolistic competition model (that the Melitz model relies on), where "firms'

markups are exogenously fixed by the symmetric elasticity of substitution between varieties" (Melitz, 2003:1697). However, Melitz believes that by allowing for a variation in the range of total varieties produced with exposure to trade, the model is "tractable enough to perform analytical comparisons of steady states that reflect different levels of exposure to trade" (Melitz, 2003:1697).

Although the model deals with symmetric countries, nonetheless, it's still possible to apply it in the current study as country size is said to affect only the number of firms but not their productivity levels. The model is set up as follows:

4.3.1.1 Consumption and Production

Consumer preference is given by a Constant Elasticity of Substitution (CES) utility function over a continuum of goods that is indexed by ω:

$$U = \left[\int_{\omega\in\Omega} q(\omega)^{\rho}\, d\omega\right]^{1/\rho} \qquad (2.1)$$

Where: Ω= mass of available goods and the goods are said to be substitutes, which implies that $0 < \rho < 1$ and $\sigma = 1/(1-\rho) > 1$ is the elasticity of substitution between any two goods. $q(\omega)$ is the output variety of ω, $d(\omega)$ is the demand for variety, ω and q is the output of a firm. Based on Dixit and Stiglitz (1977), consumer behaviour is modelled as a set of varieties consumed as an aggregate good $Q \equiv$ U that is associated with a given aggregate price, P as:

$$P = \left[\int_{\omega\in\Omega} p(\omega)^{1-\sigma} d\omega\right]^{\frac{1}{1-\sigma}} \qquad (2.2)$$

An optimal consumption and expenditure decisions of individual varieties is obtained based on the above aggregates using equations 2.3 and 2.4:

$$q(\omega) = Q\left[\frac{p(\omega)}{P}\right]^{-\sigma} \qquad (2.3)$$

and

$$r(\omega) = R\left[\frac{p(\omega)}{P}\right]^{1-\sigma} \qquad (2.4)$$

Where: $R = PQ = \int_{\omega\epsilon\Omega} r(\omega) d\omega$ is aggregate expenditure, Q is aggregate output and r is the revenue of a firm.

For production to take place, labour is the only factor required and it is said to be inelastically available at its aggregate level L_a, which is an index of an economy's size. There is a continuum of firms, with each deciding to produce a different variety, ω. The technology of a firm is given by a cost function exhibiting a constant marginal cost with a fixed overhead cost. Labour employed is then a linear function of output q, that is:

$$l = f + {}^{q}/_{\varphi} \qquad (2.5)$$

Where *l* is labour, *f* is fixed cost and φ is the level of firm productivity.

All firms are deemed to have the same fixed cost, that is, $f > 0$, but with different productivity levels indexed by $\varphi > 0$. A firm with higher productivity is seen as producing a symmetric variety at a lower marginal cost or it said to be producing a higher quality variety at an equal cost. However, irrespective of a firm's productivity, each firm is faced with a residual demand curve with constant elasticity, σ. Therefore, they have the same profit maximising markup as:

$$\sigma/(\sigma - 1) = {}^{1}/_{\rho} \qquad (2.6)$$

Hence, a pricing rule result as:

$$p(\varphi) = \frac{w}{p\varphi} \qquad (2.7)$$

Where: *w* = common wage rate, which is normalized to 1. Thus, firm profit is given by:

$$\pi(\varphi) = r(\varphi) - l(\varphi) = \frac{r(\varphi)}{\sigma} - f \qquad (2.8)$$

Where: $r(\varphi)$ = firm revenue; $\frac{r(\varphi)}{\sigma} = variable\ profit$ and $\pi =$ profit of a firm. It must be noted that $r(\varphi)$ and $\pi(\varphi)$ also depend on the aggregate price and revenue given in equations 2.3 and 2.4. Thus:

$$r(\varphi) = R(P\rho\varphi)^{\sigma-1} \qquad (2.9)$$

$$\pi(\varphi) = \frac{R}{\sigma}(P\rho\varphi)^{\sigma-1} - f \qquad (2.10)$$

The ratios of any two firms' outputs and revenues are said to depend on the ratio of their productivity levels as shown in equation 2.11:

$$\frac{q(\varphi_1)}{q(\varphi_2)} = \left(\frac{\varphi_1}{\varphi_2}\right)^{\sigma}, \frac{r(\varphi_1)}{r(\varphi_2)} = \left(\frac{\varphi_1}{\varphi_2}\right)^{\sigma-1} \qquad (2.11)$$

In effect, a more productive firm (higher φ) will be bigger (have larger output and revenues), charge a lower price, and therefore earn more profits than a less productive firm.

At equilibrium, there will be a mass of firms, F. That is, F goods and a distribution $\mu(\varphi)$ of productivity levels over a subset of (0, ∞). Therefore, aggregate price, P as defined in (2.2) is given in this case as:

$$P = \left[\int_0^{\infty} p(\varphi)^{1-\sigma} F\mu(\varphi)\, d\omega\right]^{\frac{1}{1-\sigma}} \qquad (2.12)$$

From the price rule in (2.7), this can be rewritten as:

$$P = F^{1/(1-\sigma)} p(\tilde{\varphi}) \qquad (2.13)$$

Where: $\tilde{\varphi}$ is the weighted average of firm productivity levels φ and given as:

$$\tilde{\varphi} = \left[\int_0^{\infty} \varphi^{\sigma-1}\, \mu(\varphi) d\varphi\right]^{\frac{1}{\sigma-1}} \qquad (2.14)$$

The weighted average is assumed to be independent of the number of firms' F and the relative outputs shares of firms with different levels of productivity is reflected in the weights. $\tilde{\varphi}$ is also said to be the aggregate productivity since it "completely summarizes the information in the distribution of productivity levels relevant for all aggregate variables" (Melitz, 2003:1700).

Hence, the average firm productivity level $= \tilde{\varphi}$, whereas average firm revenue, $\bar{r}$ and average firm profit, $\bar{\pi}$ at such an average productivity are given as:

$$\bar{r} = R/F \quad (2.15)$$

$$\bar{\pi} = \Pi/F \quad (2.16)$$

Where: R and Π are defined as aggregate revenue or expenditure and aggregate profit respectively and given as:

$$R = PQ = Fr(\tilde{\varphi}) \; and \; \Pi = F\pi(\tilde{\varphi}) \qquad (2.17)$$

That is: $R = \int_0^{\infty} r(\varphi)\, F\mu(\varphi) d\varphi \;\; and \; \Pi = \int_0^{\infty} \pi(\varphi) F\, \mu(\varphi) d\varphi$

P and Q are defined as:

$$P = F^{\frac{1}{1-\sigma}} p(\tilde{\varphi})$$

$$Q = F^{1/\rho} q(\tilde{\varphi})$$

Zero Cutoff Profit (ZCP) Condition:

The average productivity level is determined by the cutoff productivity level, φ^*; hence, average profit and revenue levels does also depend on the cutoff level, therefore the zero cut off profit condition is given as:

$$\bar{r} = r(\tilde{\varphi}) = \left[\frac{\tilde{\varphi}(\varphi^*)}{\varphi^*}\right]^{\sigma-1}, \quad \bar{\pi} = \pi(\tilde{\varphi}) = \left[\frac{\tilde{\varphi}(\varphi^*)}{\varphi^*}\right]^{\sigma-1} \frac{r(\varphi^*)}{\sigma} - f \qquad (2.18)$$

This implies that there is a relation between firm average profit and the cutoff productivity level. That is: $\pi(\varphi^*) = 0 \iff r(\varphi^*) = \sigma f \iff \bar{\pi} = fk(\varphi^*)$ (2.19)

Free Entry (FE) and Value of Firms:

All firms aside the cutoff firm are said to earn positive profits, hence average profit level must be positive. The expectations of positive future profits serve as the motivation for firms to sink the investment cost f_e that is required for entry. The present value of the average profit flows, represented as $\bar{v}$ is given as:

$$\bar{v} = \sum_{t=0}^{\infty} (1-\delta)^t \bar{\pi} = (1/\delta)\bar{\pi} \qquad (2.20)$$

$\delta =$ probability of exit and $\bar{v}$ is also the average value of firms that is conditioned on successful entry, hence:

$$\bar{v} = \int_{\varphi^*}^{\infty} v(\varphi)\mu(\varphi)\, d\varphi \qquad (2.21)$$

At the free level of entry, a firm's net value, v_e is then set to:

$$v_e = p_{in}\bar{v} - f_e = \frac{1 - G(\varphi^*)}{\delta}\bar{\pi} - f_e \qquad (2.22)$$

Where: p_{in} is the probability of successful entry and $G(\varphi^*)$ is the continuous cumulative distribution at the cutoff productivity level.

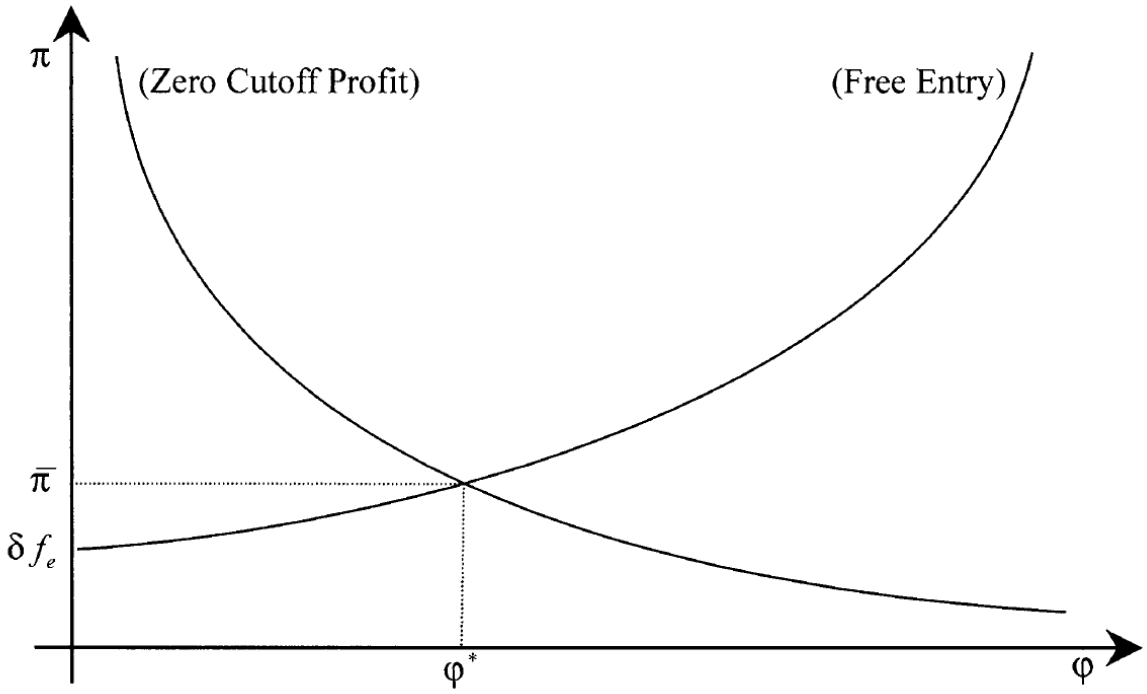
4.3.1.2 Equilibrium in a Closed Economy

From equations 2.19 and 2.22, both the zero-cutoff profit and the free entry conditions are two different relationships that link the average profit level $\bar{\pi}$ with the cutoff productivity level, φ^*. That is:

$$\bar{\pi} = fk(\varphi^*)(ZCP), \quad \bar{\pi} = \frac{\delta f_e}{1 - G(\varphi^*)}(FE) \quad (2.23)$$

The FE curve witnesses an increasing trend and it cuts the ZCP curve only once from above in the space $((\varphi, \pi)$ and resulting into the equilibrium at φ^* and $\bar{\pi}$ as depicted in Figure 4.1 below.

Figure 4.1: Determination of the Equilibrium Cutoff and Average Profit.



Source: Melitz (2003).

For any given period in the stationary equilibrium, equation 2.24 can be used to determine the mass of producing firms:

$$F = \frac{R}{\bar{r}} = \frac{L_a}{\sigma(\bar{\pi} + f)} \quad (2.24)$$

This allows for the determination of the equilibrium price index as:

$$P = F^{1/1-\sigma} P(\tilde{\varphi}) = F^{1/(1-\sigma)}/\rho\tilde{\varphi} \quad (2.25)$$

4.3.1.3 Equilibrium in an Open Economy

Here, firms into exports set higher prices in the foreign markets in that their marginal cost of serving these markets is increased and given as:

$$p_x(\varphi) = \tau/\rho\varphi = \tau p_d(\varphi) \qquad (2.26)$$

Where: τ is the trade cost.

Since firms often than not do not only produce for the export market but also for the domestic market, revenues and profits of firms in any given country can be divided into two. Therefore, domestic revenue can be written as:

$$r_d(\varphi) = R(P\rho\varphi)^{\sigma-1} \qquad (2.27)$$

whilst the revenue from export sales is given as:

$$r_x(\varphi) = \tau^{1-\sigma} r_d(\varphi) \qquad (2.28)$$

Where: *d* and *x* refer to domestic and exports respectively, R and P are aggregate expenditure and Price index respectively in each country, but R is also the aggregate revenue of firms in a country. In this case, the combined revenue of a firm is dependent on its export status as:

$$r = (\varphi) = \begin{cases} r_d(\varphi) \ \ if\ the\ firm\ does\ not\ export, \\ r_d(\varphi) + nr_x(\varphi) = (1 + n\tau^{1-\sigma}) r_d(\varphi) \\ \ \ if\ the\ firm\ exports\ to\ all\ countries. \end{cases} \qquad (2.29)$$

Thus, the overhead production cost of a firm can be accounted for in its domestic profit, π_d and so the domestic and export profits can be written as:

$$\pi_d(\varphi) = \frac{r_d(\varphi)}{\sigma} - f, \quad \pi_x(\varphi) = \frac{r_x(\varphi)}{\sigma} - f_x. \qquad (2.30)$$

Where:

f_x is the fixed cost of export, π_x is the export profit and n is the mass of varieties produced.

The combined profit of a firm is then given as:

$$\pi(\varphi) = \pi_d(\varphi) + max\{0, n\pi_x(\varphi)\} \qquad (2.31)$$

The new cutoff productivity levels for exporting firms are: $\varphi_x^* = inf\{\varphi: \varphi \geq \varphi^*\ and\ \pi_x(\varphi) > 0\}$.With $\varphi_x^* = \varphi^*$,it implies that all firms operate in the export market and so firms with productivity levels $\varphi^* = \varphi_x^*$ earn zero total profit (that is, $(\varphi^*) = \pi_d(\varphi^*) + n\pi_x(\varphi^*) = 0$)

and a nonnegative export profit of ($\pi_x(\varphi^*) \geq 0$) is earned. However, for firms where $\varphi_x^* > \varphi^*$, some firms, that is those with productivity levels between $\varphi^* and\ \varphi_x^*$will produce only for the domestic market and do not engage in the export market since their profits would be negative if they do (see Figure 4.2). They however earn non-negative profits from their participation in the domestic market. Positive profits are earned in both the domestic and export markets for firms with productivity levels above φ_x^* (as depicted in Figure 4.2) but the cut-off levels must satisfy the conditions: $\pi_d(\varphi^*) = 0\ and\ \pi_x(\varphi_x^*) = 0$

Therefore, based on the productivity averages $\tilde{\varphi}\ and\ \tilde{\varphi}_x$, average profit and revenue levels of different groups of firms can be derived. That is: the overall average of all firms in terms of combined revenue and profit is given as:

$$\bar{r} = r_d(\tilde{\varphi}) + p_x n r_x(\tilde{\varphi}_x), \quad \bar{\pi} = \pi_d(\tilde{\varphi}) + p_x n \pi_x(\tilde{\varphi}_x) \qquad (2.32)$$

Here also, the zero-cutoff profit condition implies a relationship between the average firm profit and the cut-off productivity level as was the case with the closed equilibrium. Hence:

$$\pi_d(\varphi^*) = 0 \iff \pi_d(\tilde{\varphi}) = fk(\varphi^*), \quad \pi_x(\varphi_x^*) = 0 \iff \pi_x(\tilde{\varphi}_x) = f_x k(\varphi_x^*) \quad (2.33)$$

Thus, φ_x^* can be written as a function of $\varphi^*\ as$:

$$\frac{r_x(\varphi_x^*)}{r_d(\varphi^*)} = \tau^{1-\sigma}\left(\frac{\varphi_x^*}{\varphi^*}\right)^{\sigma-1} = \frac{f_x}{f} \qquad \Leftrightarrow \qquad \varphi_x^* = \varphi^x \tau \left(\frac{f_x}{f}\right)^{\frac{1}{\sigma-1}} \qquad (2.34)$$

From 2.32, we can express $\bar{\pi}$ as a function of the cutoff level φ^* as in equation 2.35 which identifies the new zero cut-off condition in the open economy.

$$\begin{aligned} \bar{\pi} &= \pi_d(\tilde{\varphi}) + p_x n \pi_x(\tilde{\varphi}_x) \\ &= fk(\varphi^*) + p_x n f_x k(\varphi_x^*) \qquad (ZCP) \end{aligned} \qquad (2.35)$$

4.3.1.4 Impact of Trade

The model analyses the long-term effects of trade using steady state equilibria comparisons of a closed and open economy. In the absence of trade, the cut-off and average productivity levels are denoted by $\varphi_a^*$and $\tilde{\varphi}_a$ respectively. A comparison of the ZCP conditions in the open and closed economies show that the ZCP curve shifts up with an exposure to trade. That is, trade exposure leads to an increase in the cut-off productivity level $\varphi^* > \varphi_a^*$ and the average firm profit. In that, the least productive firms that have productivity levels between φ_a^* and φ^* are unable to earn positive profits in the new trade equilibrium, thereby exiting. However, firms

with a productivity level above φ_x^* self-select into the export market. In effect, both the domestic and export market selections effects cause a reallocation of market shares to the more efficient firms.

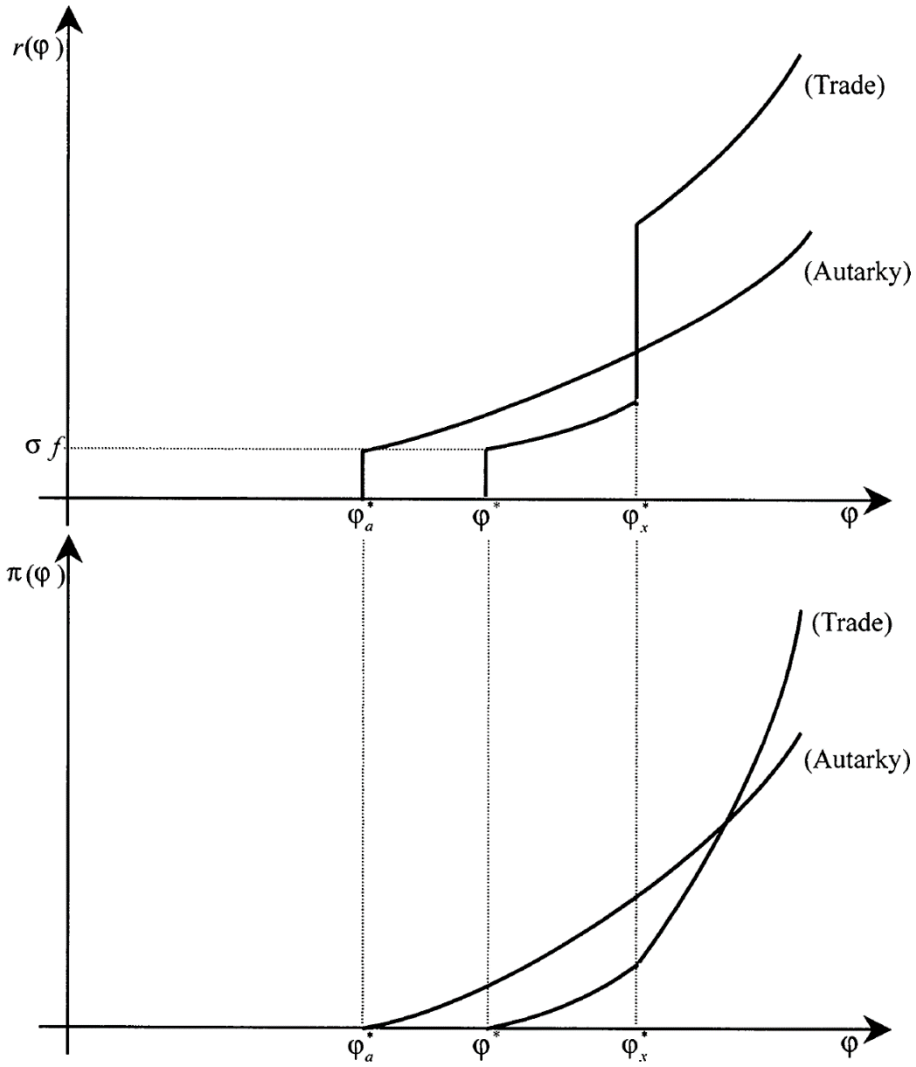
In the open economy, all firms are said to incur domestic sales losses and non-exporters incur total revenue losses in addition. However, exporters increase their total revenues via increased export sales that more than caters for their losses. Therefore, exporting firms increase their share of revenue in the industry whilst non-exporters loss their market share. This has an effect on profits as well. For instance, firms that do not export in an open economy incur profit losses as their revenues and variables profits become lower. For a firm into exports, that is $\geq \varphi_x^*$, the change in profit, $\Delta\pi$ can be written as:

$$\Delta\pi(\varphi) = \pi(\varphi) - \pi_a(\varphi) = \frac{1}{\sigma}\left([r_d(\varphi) + nr_x(\varphi)] - r_a(\varphi)\right) - nf_x$$

$$= \varphi^{\sigma-1} f\left[\frac{1 + n\tau^{1-\sigma}}{(\varphi^*)^{\sigma-1}} - \frac{1}{(\varphi_a^*)^{\sigma-1}}\right] - nf_x \qquad (2.36)$$

Where: $\Delta\pi(\varphi) = \text{the profit change}$ and it's an increasing function of firm productivity level. Thus, the gain in profit increases with productivity in that firms can be categorized into profit gainers or losers based on their productivity. In Figure 4.2 below, the changes in revenues and profits that occur as a result of trade are presented. In both cases, trade brings about an increase above that which will be earned in autarky for the most efficient firms (i.e. $\varphi > \varphi_x^*$). For firms into exporting that have a cutoff productivity level of φ_x^* , the profit change is negative.

Figure 4.2: The Reallocation of Market Shares and Profits.



Source: Melitz (2003).

4.3.1.5 Impact of Trade Liberalization

Key to this thesis is the model's assessment of the impact of increased exposure to trade and decreases in trade cost over time. These effects are analyzed through an increase in the number of trading partners and decreases in either the fixed (*f*) or variable (τ) trade costs. The model is also suited to address other specific policies in relation to trade liberalization, but of particular interest to this thesis is its effect of a decrease in trade cost either through fixed or variable costs. Per the model, such decreases in trade costs could arise either from decreases in real cost levels or tariff reductions or lowering non-tariff barriers to trade. The model reveals that an increased exposure to trade will result in the exit of the least productive firms and cause a reallocation of the market share from less productive to more productive firms. Generally, less productive firms that are not into exports incur losses in both their revenues and profits whilst profit increases are witnessed by the most productive firms in the export market.

Decrease in trade costs (τ, f):

To examine the model's effects of trade cost reductions, the old equilibrium is described in terms of the open economy equilibrium, whilst the new equilibrium is defined by variables and functions with primes. The new zero cutoff profit condition is then defined as a function of the domestic cutoff φ^* from equations 2.34 and 2.35. The outcome shows that a decrease in τ (i.e.$\tau' < \tau$) results in a shift in the ZCP curve upwards and causes an increase in the productivity cutoff levels (i.e. $\varphi^{*\prime} > \varphi^{*)}$. However, the new export productivity cutoff level $\varphi_x^{*\prime}$ is below φ^*(i.e.$\varphi^{*\prime} < \varphi^{*)}$. As observed in the transition from autarky, the increased exposure to trade forces firms to give up a portion of their domestic market share $\{r_d'(\varphi) < r_d(\varphi)\}$. In other words, they lose some domestic sales such that less productive firms not engaged in the export market (i.e., $\varphi < \varphi_x^{*\prime}$) incur losses in both their market share and profits. Subsequently, the least productive firms are forced to exit and at the same time causing the entry into the export market of new firms (i.e., firms that did not export with higher τ). On the other hand, firms that are more productive and exporting generate more revenue through increased export sales to make up for their domestic sale losses with the most productive of them increasing their profits.

In the same way, a decrease in the fixed export market entry cost, f_x results in changes similar to that described above in the case of a decrease in τ. In other words, trade exposure results in the exit of least productive firms (φ^* rises) whilst creating new entrants into the export market (decrease in φ_x^*). However, unlike in τ, existing exporting firms do not record any increases in their combined market share or profit as a result of decreases in f_x, rather only new entrants into the export market enjoy such increases.

4.3.2 Model Implications for Empirical Results

A key assumption of the Melitz model is that firms are heterogenous. In other words, firms differ with respect to their size, cost structure, profits and productivity. Such differences further determine whether firms can engage in international trade or not. For instance, the ability to export is largely hinged on the productivity levels of firms according to the ECB (2017), and larger firms are associated with higher productivity (ECB, 2017; Francis and Honorati, 2016). It is to be expected therefore that firms in our dataset that engage in exporting, are bigger, more productive and more profitable than non-exporters.

Also, firms are said to face an iceberg trade cost (i.e. a per unit trade cost) per the Melitz model. Therefore, firms that export are said to face a fixed export cost. Due to such cost and other

cost[13] of entry into international markets, firms engaged in international trade might have lower profit margins in comparison to domestic firms, that incur no such cost. Nonetheless, firms that engage in international trade, are mostly larger, more productive and have a higher probability of survival. Indeed, the ECB (2017) opines that in all sectors, exporting firms are seen to be more productive, larger and more capital-intensive. As such, it is possible for such firms to generate annual profits that are high above that of firms serving only the domestic market as the Melitz model suggests irrespective of the stiff competition associated with international markets. Therefore, the conclusion derived from the model is that, for firms engaged in international trade, the more productive they are, the higher their profit margins especially for firms into exporting. In other words, their profit margins increase relative to increases in their productivity. On this basis, it is expected that firms in the current study that import, or export will be more productive and profitable than domestic-oriented firms. Furthermore, international markets are known to be highly competitive, such competition drives innovation that leads to firms becoming more productive. Hence, we envisage that firms that trade internationally are much productive and profitable relative to their domestic counterparts.

As per the Melitz model, labour is the only input factor employed, however, materials costs and capital are important inputs in the manufacturing sector. Therefore, our empirical model has been adjusted to include both capital and materials inputs. This implies that the empirical conclusions/results could differ from that suggested. On the other hand, it allows that capital together with labour and materials/intermediate inputs determine the total productivity of firms. In this light, we employ a standard Cobb-Douglas production function with three factor inputs of labour, capital and materials in the empirical model in chapter 7.

4.3.3 Empirical Studies on the Productivity Effects of Trade

It has been argued that the existing literature on opening up, either through reductions in tariffs or quota points to associated productivity gains (De Loecker, 2011). This subsection details such evidence on the tariff-productivity relationship. On the empirical evidence of trade effects on firm performance, Abreha, (2014) in his study of Ethiopian manufacturing firms spanning from 1996-2011 found productivity gains from importing. His findings reveal that importers perform better and also provide evidence that supports learning-by-importing. A study of Ghanaian manufacturing firms by Ackah et al. (2012a) also found a large positive effect of tariff reductions on total factor productivity and a strong effect of export intensity on

[13] Such as cost of credit, tariff and non-tariff barriers, cost of getting information on foreign markets, logistics costs etc.

productivity. Thus, they concluded that there exists a strong negative impact of nominal tariffs on firm productivity. This is supported by Bigsten et al. (2009), as they found large positive effects of tariff reductions on productivity from their study of Ethiopian manufacturing firms covering 1997 – 2005. In particular, they indicate that excessive tariff levels may be distortionary and that tariff reductions have resulted in smaller and more capital-intensive domestic markets. Their results offer evidence in support of the assertion that trade liberalization results in competition in domestic markets.

A further study by Bigsten et al. (2016) using firm level manufacturing data from Ethiopia confirms that tariff reductions on intermediate inputs result in higher productivity gains. Likewise, Foster-McGregor et al., (2016) employing manufacturing firm level data of 19 Sub-Saharan African countries found that on the average, importers were more productive than non-importers. They therefore concluded that the costs of importing in the form of import quotas and duties should be reduced to enable less productive firms have access to foreign resources. Their results are supported by Nyantakyi and Munemo (2014) who studied manufacturing firms in three Sub-Saharan countries (Ghana, Kenya and Tanzania) and concluded that firm performance will improve if tariffs on imported capital goods are eliminated since their results revealed that increasing imports of capital goods has significant positive effect on productivity. Using firm and industry level data, their results suggest that further improvements in access to foreign technology via trade liberalization could result in significant productivity improvements of technically incompetent firms.

Similar to the above evidence, exporting is reported to improve productivity. Using stochastic frontier efficiency models, Bigsten et al. (1998) discovered from both random effects and time-variant productivity models that exporters are more efficient than non-exporters. Mengistae and Pattillo (2002) corroborate their results with their findings that exporting manufacturers' have a total factor productivity premium of 11- 28% in their study of three Sub-Saharan African countries using firm level panel data. A further examination of the export – productivity nexus by Mengistae and Pattillo (2004) revealed a 17% average total factor productivity premium for export manufacturers. Their findings also suggest that exporting firms had a 10% productivity growth than non-exporters.

Studies of Fatou and Choi (2013), Bigsten and Gebreeyesus (2009) and Bigsten et al. (2004) have suggested a positive relationship between exporting and productivity in African manufacturing industries. A study of manufacturing firms in nine African countries revealed

that exporters in those countries were more productive and increased their productivity advantage after entry into the export market (Van Biesebroeck, 2005). In a similar way, a strong effect of export intensity on productivity among manufacturing firms in Ghana was ascertained by Ackah et al. (2012a). Their study further suggests that high exporting firms in low tariff areas enjoy high productivity than low exporters and non-exporting firms. Therefore, concluding that there is a large positive effect of tariff reductions on total factor productivity. Their results have been strengthened by the study of Bresnahan et al. (2016) who found a positive association between export intensity and productivity using manufacturing firm level panel data from four African countries (Ghana, Kenya, Tanzania and Nigeria). The results showed that exporting firms were in most cases significantly productive than firms selling in the domestic markets. Another study in the African context that confirms the learning by exporting hypothesis is that of Siba and Gebreeyesus (2014) who focused on Ethiopian manufacturing firms. They found that firm productivity improved by 8 -19 percentage points from previous exporting. However, their results indicate that the learning-by-exporting effect occurs only when exports are made to developed countries with technological advancement and not to other developing countries.

Other studies on the tariff-productivity nexus in other countries aside Africa also point to similar conclusions. The study of Yu (2014) revealed that reducing input tariffs leads to stronger productivity improvement in processing firms than reducing output tariffs for non-processing firms in China. He therefore concluded that reducing input tariffs has a greater effect on productivity improvement than reducing output tariffs for non-processing large Chinese trading firms in the new century.

In a similar way, Amiti and Konings (2007) found that a 10-percentage point decrease in input tariffs leads to a 12% productivity gain for firms that import their inputs in their study of Indonesian firms. Their results indicate that the gains from input tariff reductions are at least twice as high as any gains from reducing output tariffs. Their study is purported to be the first empirical study that employed input tariffs in examining such a relationship. They made use of the Olley-Pakes (1996) method in their analysis. Their results are corroborated by that of Hansen (2010a) whose study results revealed that a 10-percentage point fall in tariff rates resulted in up to 2% total factor productivity gains in his analysis of the impact of tariff cuts within the Eastern European enlargement on German and Austrian firm productivity. He concluded that tariff reductions significantly raised the productivity of parent firms. Similarly,

Yu (2014) found that input and output tariff reductions impact positively on productivity and are said to contribute 14.5% to economy-wide productivity growth. He also found from his study of large Chinese firms that a 10-percentage point decrease in input tariffs resulted to a 5.1% productivity gain.

Ge et al. (2011) also found from their study of Chinese firms covering 2000 - 2006, that a 1% decrease in input tariff resulted in an increase in total import value by 3.1%, an increase in intermediate inputs by 2.6% and a 4.3% increase in the value of imported capital goods. On the link between intermediate imports and productivity, their results reveal that a 10% increase in imported intermediate value led to an increase in total factor productivity of 0.5% whilst a 10% increase in capital goods imports resulted in an increase of 0.2% in productivity. Their results also suggest that larger and more capital-intensive firms import more and from more advanced countries as well as have access to a wider range of inputs. Hence, they conclude that trade reform-induced import significantly impacts firm performance through increasing the volume of imports, accessing new varieties and shifting to imports from more advanced countries which are said to significantly improve productivity, output and average wage of importers. Therefore, they provide evidence in support of the learning, variety and quality effects of trade liberalization on firm productivity gains.

Likewise, a study by Topalova and Khandelwal (2011) on the effect of trade liberalization on productivity suggest that both lower tariffs on inputs and final goods did increase firm-level productivity in India with input tariffs having the larger impacts. Additionally, Pavnick (2002) found that trade liberalization led to within plant productivity improvements in Chile for plants in the import-competing sector. Another study using firm level Chilean manufacturing longitudinal data by Kashara and Rodrigue (2008) found positive impact of imported intermediates on plant level productivity using four different estimators of within group estimator, the system GMM estimator, the Olley-Pakes (1996) and Levinsohn and Petrin (2003) estimators. Their results reveal that productivity is improved with foreign intermediates imports. These results conform to the findings of Fernandes (2007) that tariff liberalization has a strong positive impact on plant productivity although stronger for larger plants and those in less competitive industries

In the same way, Halpern et al. (2015) posit that firms that import all input varieties record about 22% increase in their revenue productivity as shown in their study of Hungarian firms (1993 – 2002). Their findings also indicate that productivity gains from tariff cuts are larger in

an economy that has lots of importers and foreign firms. They concluded that about one-quarter of productivity growth in Hungarian firms during this period was attributed to imported inputs. Similarly, Fan et al. (2015) strongly suggest that access to imported intermediate inputs can substantially increase the ability of firms to deliver high-quality goods to foreign markets. On the other hand, high import tariffs have been found to discourage capital accumulation by raising the price of imported capital goods (Irwin, 2000). This implies that high tariffs and stringent trade barriers are detrimental to firm productivity and economic growth in general.

On the performance of exporting firms in other continents besides Africa, Hansen (2010b) found that firms that export are 40% more productive than non-exporters. Similarly, Baldwin and Gu (2003) and Baldwin and Yan (2012) assert that exporting boost productivity using data from the Canadian manufacturing sector. Wagner (2005) in his study of firm-level data from 33 countries covering the period 1995 -2004 found that exporters have higher productivity and more productive than non-exporters. Likewise, a study of Japanese firms revealed that firms that exports have high productivity and those who maintain their foreign presence through exports have even higher productivity (Kimura and Kiyota, 2006). In the same way, the results of Aw et al. (2011) in their study of Taiwanese firms show that exports have a positive effect on a plant's future productivity.

4.3.4 Empirical Evidence of the Profitability Effects of Trade

Not so many studies have been conducted on the trade-profitability nexus, more especially in the context of Africa. However, the results have been divergent. On the one hand, some studies have concluded that a negative relationship exist between import penetration and firm profitability. Among them are the following: In their study of 15 manufacturing industries in 10 countries of the euro area from 1995-2004, Peltonen et al. (2008) found that an increase in the total import penetration by 10% resulted in a 0.9% decrease in profitability. In other words, there was a significant negative effect of total imports on profitability in the euro area. Nonetheless, this was based on productivity, domestic competition, regulations and labour market conditions. Similarly, Baggs and Brander (2006) in their study of Canadian firms revealed that decreasing domestic tariffs resulted in declining firm profits especially for firms in import-competing industries. On the other hand, declining foreign tariffs were found to result in increasing profits for export-oriented firms.

Furthermore, the studies of Kambhampati and Parikh (2003, 2005) and Beng and Yen (1977) support the assertion that tariffs enable producers to earn higher domestic profits. In other

words, they assert that higher tariffs allow domestic producers to earn higher profits and vice versa. That is to say that reducing tariffs result in low profits for firms that serve the domestic market. Beng and Yen (1977) in their study of Malaysian manufacturing industries found that domestic industries that were protected via tariff barriers enjoyed higher profits. In like manner, Kambhampati and Parikh (2003) indicate that imports had positive impacts on profitability before trade liberalization in India, which however disappeared after. They further found later that profit margins in textiles and trading worsened with trade liberalization in India (Kambhampati and Parikh, 2005).

This notwithstanding, another strand of the literature point to a positive effect of reducing tariffs. Krugman et al. (2012) assert that trade costs reduce the profitability of exporting for all firms, in that such a reduction makes exporting unprofitable for some firms. They imply that a reduction in trade costs (e.g. decrease in tariffs, etc.) would be more profitable for firms especially those into exporting. Likewise, Wagner (2014) found that exporters of high-quality goods were more profitable. In a similar way, the results of Fryges and Wagner (2010) show that exporters are more profitable than non-exporters as revealed in their investigation of exports and profitability among German manufacturing enterprises from 1999 – 2004. Using regression analysis and generalized propensity score methodology, they found that the rate of a firm's profit tends to increase with the export-sales ratio, thereby concluding that a positive relationship exists between exporting and firm profitability. However, they did not find any evidence of profitable firms' self-selection into the export market.

Closely related to their findings are the results of Amendolagine et al. (2008) for Italian manufacturing firms from 1995 – 2003. Their investigation, which also employed regression analysis and propensity matching score revealed a positive impact of exports on firm profits: new entrants into the export market exhibited a significant growth in their gross profit rate per employee. In other words, new exporters were found to earn higher profits than their domestic counterparts. Evidence was not found in support of the self-selection into exporting hypothesis by more profitable firms. In like manner, Srithanpong (2014) suggests in his study of Thai manufacturing firms using data that covers 1999 – 2003 and 2007 that firms that do not engage in trade are the least profitable whilst exporters are said to earn higher profits. The profit performance of two-way traders and importers were however found to be the same.

Similarly, the results of Mukherjee and Chanda (2016) in their study of the Indian textile industry also support the positive effects of tariff reductions on profitability hypothesis. Their

study shows that firm level profitability improved, and imports of raw materials also increased with domestic trade liberalization over the data period of 2000 – 2009. The effect was stronger for input tariffs reductions. Additionally, larger firms were found to have benefited more from such liberalization in comparison to smaller firms. In other words, larger firms that are able to take advantage of tariff reductions by increasing their imports of quality inputs/goods are able to earn more profits than smaller firms that are unable to capitalize on such reductions due to their size. In the same way, Breinlich (2016) in his study of Canadian firms show that intermediate input tariff reductions led to higher profits for importers. Using an event study approach to look at the link between tariff reductions and profitability, his results show that overall, per-period profits increased by about 1.2% as a result of the Canada United States Free Trade Agreement (CUSFTA) of 1989, which they believe was mainly due to reductions in intermediate input tariffs.

Ruane and Sutherland (2005) also found that in general, exporters had superior performance than their domestic counterparts. Their findings reveal a positive and significant impact of exporting on profitability, which they measured as labour gross value added. They obtained their results using descriptive statistics and random effects panel data regression methods in analyzing Irish manufacturing firms for the period 1991 – 1998. Likewise, Kambhampati and Parikh (2003) show that exports led to lower profit margins before 1991 in India, but the reverse was witnessed after the post 1991 trade liberalization. That is, exports did increase profit margins with liberalization in India. Another study of Kambhampati and Parikh (2005) on India revealed that at the manufacturing level in general, profit margins which hitherto were decreasing did stabilize after trade liberalization. They show further that profit margins increased after liberalization in five sectors namely, paper, chemicals, cement, food processing and plantations.

Nonetheless, a strand of the empirical literature reveals the absence of any statistically significant effect of trade on firm profitability. One of such is that of Wagner (2011) who studied German manufacturing enterprises and found that a firm's rate of profit does not vary with respect to its participation in international trade. That is, whether firms were engaged in imports only, exports only or both imports and exports trade had no impact on their profits. In a similar fashion, Grazzi (2012) did not find any differences in profitability between exporters and non-exporters among Italian manufacturing firms in the period 1989 – 2004. Employing both non-parametric methods and regression analysis, he revealed a lack of relationship between exporting and profitability even with a closer focus on more export intensive sectors.

Likewise, Girma et al. (2004) could not find any significant difference in profitability between exporters and non-exporters due to export trade. They arrived at this conclusion using descriptive statistics and Kolmogorov-Smirnov tests in studying Irish firms for the period 2000. In the same way, Vu et al. (2014) in their study of manufacturing SMEs in Vietnam (2005 – 2009) revealed the absence of a linkage between exporting and firm profitability using an OLS approach. However, they found that exporting is positively related to profitability in the case of firms with high profit growth and negative for firms with low profit growth using a quartile approach.

Studies in the services industry have revealed similar mixed effects of trade on profitability. Temouri et al. (2013) in their studies of business services enterprises in Germany, France and the United Kingdom over the period 2003 – 2007 found divergent results across the three countries. Using methods of regression analysis and propensity score matching, service enterprises into exports were found to be less profitable than non-exporters in Germany. On the other hand, the opposite was revealed in the case of France whilst in the United Kingdom, no profitability difference was found between exporters and non-exporters. Evidence in support of the self-selection hypothesis was not found in France and the United Kingdom. Interestingly, less profitable firms self-selected into the export market in Germany, a result that digresses from the usual self-selection hypothesis.

5 DATA

This chapter details the sources and description of the data employed in the thesis. On the one hand, documentary research was undertaken to solicit policy documents that form the foundation for the Ghanaian trade policies considered in this thesis. On the other hand, tariff and firm-level data that have been utilized for the empirical analysis were taken from existing databases. Also, checks on whether the dataset used meet basic regression assumptions have been presented in this chapter.

5.1 Description of Data

Two main sources of data were employed for the empirical analysis. On the one hand, tariff data was obtained from the Centre for Prospective Studies and International Information (CEPII)[14] Tradeprod dataset compiled by De Soussa et al. (2012). The Tradeprod dataset contains bilateral tariff rates between Ghana and other countries of the world for the period 1991 to 2001. Therefore, tariff rates per year are calculated as the average of all bilateral tariff rates for each period as shown in Table 5.1. Over the period, average tariffs have either increased or decreased, and changes in tariff rates have been uniform across the different subsectors. Nevertheless, tariff rates are particularly high within the garments and beverages subsectors. In contrast, tariff rates in the machines subsector has been relatively low.

Table 5.1: Average Output Tariffs (1991 – 2001), Ghana.

Year	Food	Garments	Furniture	Metal	Beverages	Machines
1991	20.45	33.3	23.64	22.19	18.63	13.00
1992	21.42	27.27	20.53	18.8	50.00	11.98
1993	14.26	22.15	14.93	14.78	23.67	8.51
1994	23.71	30.35	21.8	21.5	38.97	14.11
1995	17.33	22.4	13.45	12.12	55.74	5.75
1996	12.54	14.36	6.82	6.95	21.94	3.52
1997	20.13	25.14	17.76	16.69	31.52	8.34
1998	14.71	18.48	13.49	12.17	31.97	7.17
1999	14.16	16.81	11.39	11.15	24.34	6.32
2000	14.48	18.46	11.1	10.5	21.65	4.46
2001	12.38	25.87	15.75	13.55	44.51	5.45

Source: De Soussa et al. (2012).

From the table, it can be seen that tariff rates increased in 1994 as a result of the imposition of an import sales tax in that year leading to the rise of tariffs. The lowest tariff rates across the 1991 – 2001 period in all subsectors were recorded in 1996, a year after Ghana joined the WTO

[14] French acronym.

which was founded in 1995. Generally, the 2001 average tariff rates are lower than that of 1991, indicating that average tariffs declined between 1991 and 2001.

Even though there are several policies used in restricting trade, giving rise to an array of indicators[15], tariff is the main measure of trade liberalization used in this thesis since the study was conducted at the firm-level and therefore, tariff rates directly affect the imports and outputs of firms.

The firm-level data for this study on the other hand, was sourced from the Ghana Manufacturing Survey, a panel database of manufacturing firms surveyed from 1992 – 2003 through the World Bank's Regional Project on Enterprise Development (RPED) that covers firm-level data from 1991 - 2002. Owing to the fact that firm-level data are hardly available in African countries, the RPED dataset is the most suitable for the current firm-level study, because it covers a sizeable number of firms (312 in total) and consists of 12 years of data, about the longest panel of firm data in a country like Ghana. Also, the survey periods coincide with the immediate aftermath of major trade reforms in Ghana, hence making it suitable for assessing the response of the Ghanaian private sector to trade liberalization policies.

The data was collected in seven rounds: the first three rounds (I–III) of data were collected annually, followed by rounds IV – IX with two years each whilst the last round covered 3 years of data. The data was gathered by the Centre for the Study of African Economies (CSAE) at Oxford University, University of Ghana and the Ghana Statistical Service and made available by CSAE. The survey gathered information on both firm and worker characteristics in the manufacturing sector. The firms are classified into various subsectors in accordance with the International Standard Industrial Classification (ISIC, Rev. 2) at the 3-digit level (see Table B.1 in Appendix B). These firms are located in four cities of Ghana, specifically, Accra, Kumasi, Cape Coast and Takoradi. All four cities are located in the southern part of Ghana and are capital seats of their respective regions (Accra is the capital city of Ghana). Most privately-owned firms are often situated in the urban areas of Ghana and this could be the reason for the choice of the cities.

The dataset[16] includes but is not limited to the following: firm-specific output, raw materials, physical and human capital, indirect material costs (which include electricity, fuel, transport

[15]Such as trade dependency ratio, IMF index of trade restrictiveness etc.
[16] See Teal (2011) for a description of the construction of the dataset.

and telephone costs), number of workers, export status, percentage of raw materials imported, type of firm ownership (private, state, foreign, Ghanaian, mixed etc.), firm age and the structure of the firm (sole proprietorship, limited liability etc.). The output and raw materials variables are based on 1991 firm-specific prices. Real indirect costs, on the other hand, are presented as per CPI (Consumer Price Index) of 1991 in million cedis whilst capital is deflated to 1991 prices in million cedis. The physical capital was depreciated at a rate of 2 %. The first 200 firms surveyed were randomly sampled from the 1987 manufacturing census conducted by the Ghana Statistical Service. The firms selected constituted a broad representation of the size distribution of firms across the major sectors of manufacturing in the country. Table 5.2 shows the composition of the sample data.

Table 5.2: Composition of Data.

Variable	No. of Observations	Percent (%)	Cummulative Percent.
Sub-sector			
Food & Beverages	201	17.14	17.14
Garments	315	26.85	43.99
Furniture	305	26.00	69.99
Metal & Machines	352	30.01	100.00
Total	1,173	100.00	
Ownership Type			
Ghanaian	971	82.78	82.78
Foreign	27	2.30	85.08
Mixed	175	14.92	100.00
Total	1,173	100.00	
Location			
Accra	656	55.92	55.92
Cape Coast	38	3.24	59.16
Kumasi	416	35.46	94.62
Takoradi	63	5.37	100.00
Total	1,173	100.00	
Firm Structure			
Sole Proprietorship	539	45.95	45.95
Partnership	110	9.38	55.33
Limited Liability Enterprise	486	41.43	96.76
Private Corporation	15	1.28	98.04
Unspecified	23	1.96	100.00
Total	1,173	100.00	

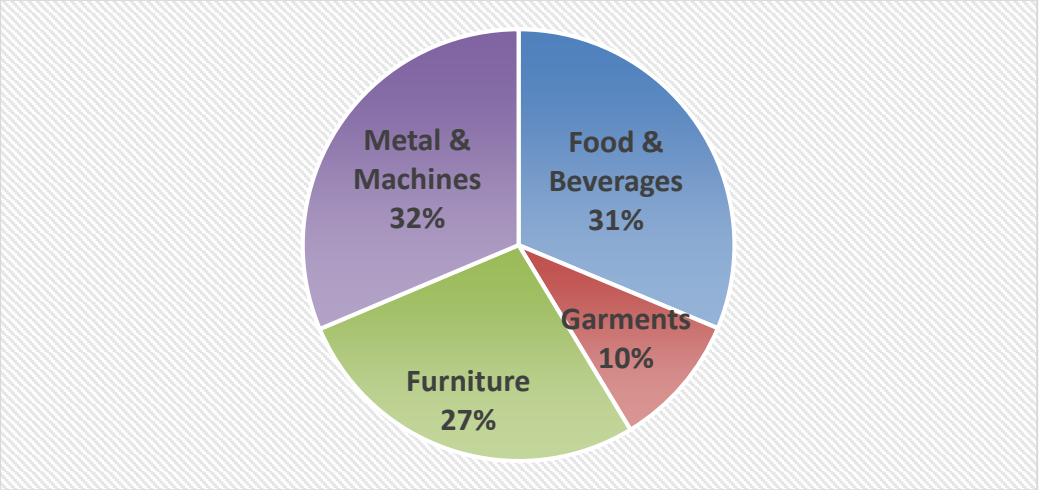
Source: Author's construct from RPED, GMES dataset.

In each wave, firms that dropped out were replaced by similar firms in order to maintain a representative sample as well as keep the number of firms the same across the survey period. It can be observed that garments, furniture, and metal and machines subsectors make up about 82% of the sampled establishments whilst food subsector has the smaller number of observations, representing about 17% as shown in Table 5.2. This is perhaps due to the large numbers of apprentices in the metal and machines, garments and furniture subsectors, who upon completion go on to start their own businesses, and therefore expanding the size of such subsectors.

In terms of location, more than half of the firms are located in the capital city, Accra (about 56% and another two thirds in the Ashanti regional capital of Kumasi (35%). In all, about 92% of the firms are located in these two big cities, depicting that many manufacturing firms are found in the urban areas. The remaining 8% are situated in Takoradi and Cape Coast. It can also be seen that the vast majority of firms are fully owned by Ghanaians (about 83%) as reported in Table 5.2. Firms with foreign ownership constitute only about 2% while about 19% are owned by a mix of both foreigners and Ghanaians. The most common form of legal organizational structure of the companies in the study are sole proprietorship (46%) and limited liability enterprises, about 41%. Partnerships form less than 10% of business organizations, and the least preferred form is private corporation (1%) while about 1.9% did not specify their form of legal organization. Diagrammatic summaries of the firm-level data per the dataset are presented in Figures 5.1 to 5.4.

In Figure 5.1, the share of employment by subsector is presented. It can be observed that the bulk of the manufacturing employment (about 90%) for the period 1991-2001 was recorded in the Metal and Machines, Food and Beverages and Furniture subsectors. The Metal and Machines subsector was the biggest employer (32%) and followed closely by the food and beverages subsector with 31%. This is presumably because of the large size of apprenticeship in these subsectors since apprentices account for a large share of employment within manufacturing. The remaining 10% of jobs are from the Garment subsector, probably because of the relatively lower wages in that sector. Undoubtedly, the employment pattern as per the dataset follows the general trend in manufacturing sector employment.

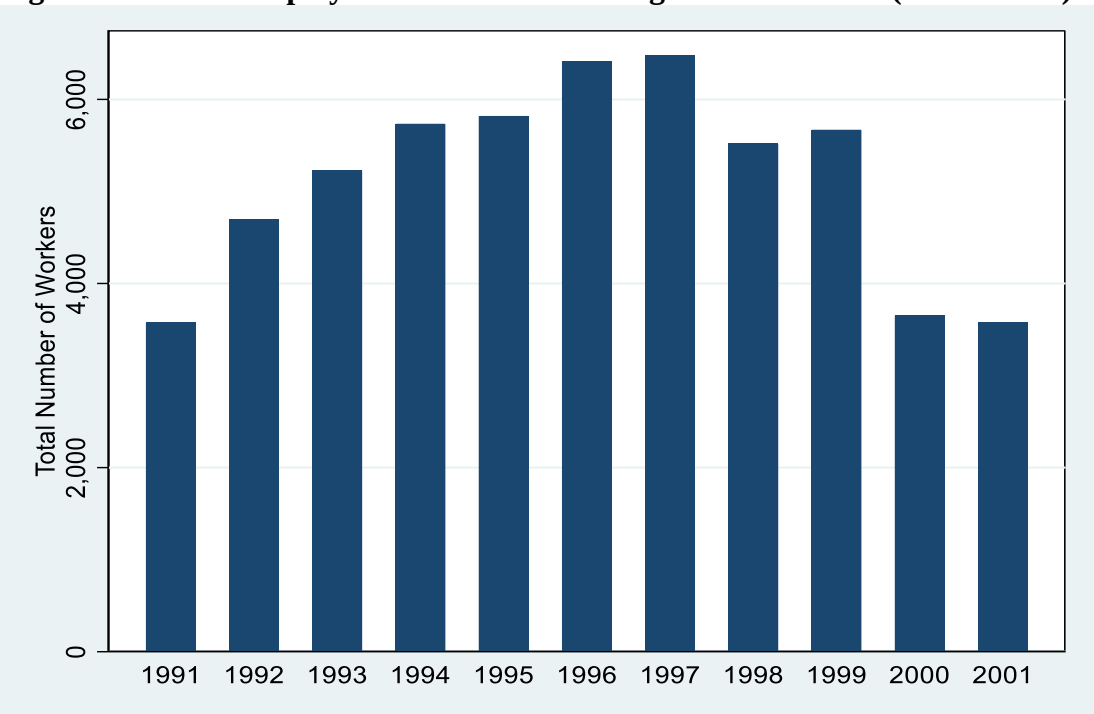
Figure 5.1: Employment Share by Sub-Sector (1991 – 2001).



Source: Author's construct from RPED, GMES dataset.

From Figure 5.2, an increasing trend in employment was witnessed in the manufacturing sector within the period reported until 1998, when it declined. The job creation within the manufacturing sector increased slightly in 1999 but declined further in 2000 and 2001. This general trend runs across all the subsector as well. A potential explanation for the decline in jobs in the manufacturing sector could also be related to the power crisis of 1998, which led to retrenchment of some employees in some firms. Although jobs created followed an upward trend from 1991 – 1997, the margin of increase was not very large.

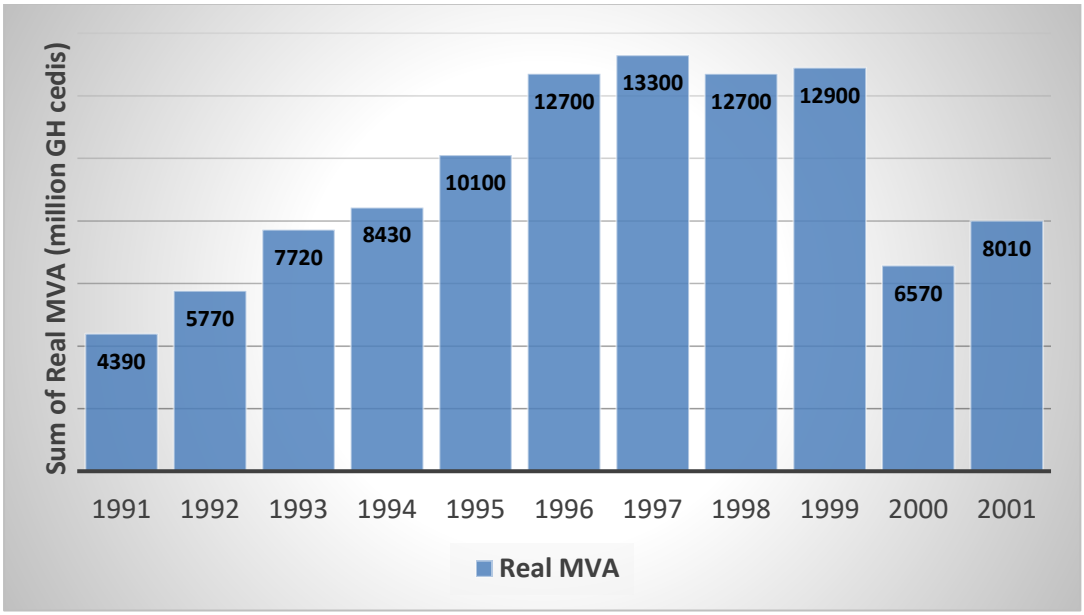
Figure 5.2: Total Employment in Manufacturing over the Period (1991 – 2001).



Source: Author's construct from RPED, GMES dataset.

The distribution of the sum of real manufacturing value added (MVA) over the years for all firms in the Manufacturing sector from the year 1991 to 2001 is shown in Figure 5.3. Generally, an increasing trend is witnessed since 1991 to 1997, the year the highest manufacturing value added was attained after which there have been some decreases in the real MVA especially in the year 2000. The declining MVA as of 1999 could be due to the power crisis that started in 1998 and might have reached its peak in 1999. Also, the labour force might have been less productive between 1998 and 2001 due to the power crisis and its associated job losses. Another possible explanation especially for the steep downward trend observed in the year 2000 could be as a result of the national elections that took place in that year and resulted in a change in government in January 2001. This is explained by reduction in investments in electioneering years in African countries due to high investor anxiety about the state of peace in the country during an election year and the uncertainty of the new government's policies immediately after the elections. Indeed, such election related uncertainty in Africa is said to often cause businesses and investors to adopt a wait-and-see approach (Dahir and Kazeem, 2019), which has an associated consequence of dwindling investments. In other words, companies and investors in the run up to elections in Africa avoid risk by putting on hold big investment decisions until elections are over and the future becomes much more certain (Mahlaka, 2019).

Figure 5.3: Annual Real Manufacturing Value Added for All Firms (1991 – 2001).

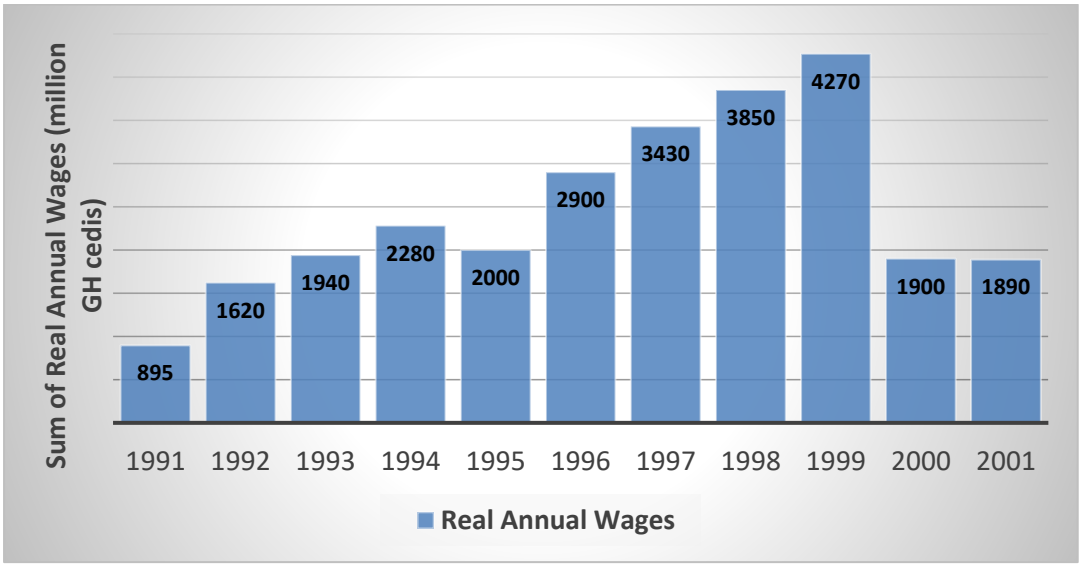


Note: Real MVA in 1991 firm specific output prices.

Source: Author's construct from RPED, GMES dataset.

The annual total real wages paid by the manufacturing firms under consideration from 1991 to 2001 is reported in Figure 5.4. On the whole, the annual real wages were increasing as would normally be expected but declined in 1995 and after the highest peak in 1999. The rising labour wages could be attributed in part to labour unionization, particularly that the formal employment sector in Ghana is mainly characterized by high rates of unionization. Indeed Kingdon et al. (2006) provide empirical evidence which shows that the union wage premium in Ghana is about 49%, much higher in contrast to 34% in South Africa, 32% in Nigeria, 22% in Tanzania and 13% in Kenya. In fact, about 29.42% of employees per the dataset employed in the current study are members of labour unions, and these unions are responsible for wage negotiations at three different levels; national, industry and firm level. Interestingly, the total annual wages were at their highest in 1999, a period where power cuts to the manufacturing industry was rife and accompanied by job losses. Hence, this period was characterized by high worker redundancies especially in private manufacturing firms due to power shortages in the country. Nonetheless, the labour policies in Ghana, especially with regards to redundancy cost whereby employers pay redundant workers an average of 178 weeks of salary (Bank of Ghana, 2007) could be the reason for the rise in total wages paid in 1999.

Figure 5.4: Manufacturing Real Annual Wages in Ghana (1991 – 2001).



Source: Author's construct from RPED, GMES dataset.

To conclude this section, it is worth noting that we assumed that firms operating in the Free Zones Areas (FZA) in Ghana, i.e., areas where firms are operating from, normally have tax holidays and import exemptions, were not captured as part of the RPED dataset. This is because, like in many other African countries, the free zones concept in Ghana in the early

2000s was fairly new and was established by an Act of parliament in August 1995 (Act 504). Nonetheless, the implementation did not commerce until late 1996; a year after the Act was passed. To be precise, the implementation in September 1996 began with the establishment of the Ghana Free Zones Board Secretariat (Angko, 2014), the body responsible for the day to day administration and implementation of the Board's resolutions. As a result, actual operations of firms at the FZA could have started much later especially that the first comprehensive study on the zones had access to data from the year 1998 (Quaicoe et al., 2017). By this, the possible inclusion of free zones firms into the dataset could have been at the last round which covered data for three years (2000 to 2002). However, the final dataset employed for the tariff-firm performance analysis ranges from a minimum of four years to a maximum of eleven years due to data cleaning. It is therefore highly unlikely that firms in Ghana's Free Zones are part of the dataset employed in the current thesis.

5.2 Sources of Documentary Information

The other source of information for this study was obtained through document research and triangulated with the RPED dataset. Documentary research method has been defined as "the analysis of documents that contain information about the phenomenon we wish to study" (Bailey, 1994:13). Simply put, it is a method used "to investigate and categorize physical sources, most commonly written documents, whether in the private or public domain" (Payne and Payne, 2004:36). Hence, it involves the use of documents as source materials that are from government publications, census publications, institutional reports and other written visual and pictorial sources in either electronic or hard copy forms. For the current thesis, documents were gathered from the World Bank and four major agencies of the government of Ghana namely: Ministry of Finance and Economic Planning; Ministry of Trade and Industry; Customs, Excise and Preventive Services; and the Ghana Statistical Service. They included but not limited to trade policies relating to the manufacturing sector that are captured in the government of Ghana budget statements, quarterly statistical digest, industrial census reports, reports on the economic recovery and structural adjustments programmes and trade and industrial policy documents. These public documents were especially important and necessary as this study hinges on trade policy effects on private manufacturing firms. An advantage of the method is that, its use is not just about recording facts; it also offers the opportunity to confront what researchers call the moral underpinnings of social inquiry (Atkinson and Coffey, 1997:55).

5.3 Existing Empirical Research from the Dataset and how the Current Study Differs

Several studies (see Table 5.3) have employed the same dataset used in this study. However, majority of these studies have either analyzed productivity broadly (Teal, 1998; Teal et. al., 2006); studied investments impacts (Söderbom and Teal, 2000); credit constraints (Bigsten et al., 2003) or export performance (Bigsten et al., 1999a) as key impact factors and have not focused on productivity and profitability (Görg and Strobl, 2005; Frazer, 2005; Teal, 2000; Waldkirch and Ofosu, 2010). Additionally, in most cases, earlier versions of the data were used which means fewer observations, mostly spanning from three years to a maximum of seven years. Moreover, all the studies as per Table 5.3 have made no distinction between state and private firms, rather firms have been lumped together and analyzed on that basis, irrespective of their ownership type in terms of private or state.

A crucial difference of the current study from the ones displayed in Table 5.3 is the focus on the private sector in this study. The private sector is said to be the means to the development of developing countries (DFID, 2008). This is particularly important in the current study because the promotion of the private sector was one of the key pillars of the SAP, that ushered in trade liberalization in Ghana. An analysis of such a liberalization on the performance of the private sector is therefore imperative. Additionally, the present thesis stands out from the earlier studies because it analyses the effects of tariff liberalization on both productivity and profitability. Both measures of firm performance have not been undertaken in a single study in the past, making the current study more comprehensive in comparison to earlier ones. In fact, only productivity as a measure of firm performance has been analyzed previously, with none examining the impact of tariffs on firm profitability. Furthermore, in this study, we employed 11 years of panel data, the longest panel, as against 3 – 7 years of a number of the previous studies that employed earlier versions of the dataset.

To the best of the author's knowledge, only three studies (Abor et. al., 2014; Nyantakyi and Munemo, 2014; Bresnahan et al., 2016) have applied the full dataset. Nonetheless, their research interest has been either on bank finance (Abor et. al., 2014) or technological gap (Nyantakyi and Munemo, 2014) and therefore different from the tariff-firm-performance analysis that has been examined in the current study. It is also worthy to note that some of the earlier studies have been cross-country studies (Nyantakyi and Munemo, 2014; Bresnahan et al., 2016; Rankin et al., 2006; Söderbom and Teal, 2001; Bigsten et al., 1999a), making it difficult to isolate country characteristics' effects, hence unable to provide reliable causal

relationships (Bruhn, 2011). This can however be accounted for in this study with the use of within-country study.

Finally, besides the current thesis, only one previous study (i.e. Ackah et al., 2012a) has researched on the impact of import tariffs on productivity. Like the current study, Ackah et al. (2012a) also employed indirect methods of analyzing productivity effects of tariff changes. Nonetheless, a great number of differences do exist between the two studies. Crucially, the focus on the private sector in the present thesis forms the major difference from that of Ackah et al. (2012a) that generally examines all firms in the dataset, without differentiating between private and state enterprises. Also, the current study covers data from 1991 – 2001, thus comprising 11 years of data. However, data from 1991 and 1992 were omitted in the study of Ackah et al. (2012a) as well as the city Cape Coast, which is a part of the current study. Additionally, this thesis employed robust standard errors that are clustered at the firm level and therefore the results are robust to both heteroscedasticity and serial correlation. On the contrary, Ackah et al. (2012a) made use of standard errors in their estimations which could potentially lead to an overestimation bias of the coefficients. Furthermore, this thesis made use of the gross output approach in estimating productivity whilst Ackah et al. (2012a) used the value-added method, an approach known to cause overestimation bias (see Diewert and Nakamura, 2007). Lastly, as previously mentioned, two key dimensions of firm performance namely productivity and profitability are examined in this study as against just productivity in the case of Ackah et al. (2012a). As a result, the current study is more comprehensive compared to their study.

Table 5.3: Empirical Studies from RPED, GMES Dataset.

Author (s)	Title	Period	Variables		Methodology	Results
			Dependent	**Independent**		
Barr (1995)	The Missing Factor: Entrepreneurial Networks, Enterprises and Economic Growth in Ghana	1992-1993	Economic outcome	Entrepreneurial networks	Production function analysis	Entrepreneurial networks are very important in determining economic outcomes
Teal (1995a)	Real Wages and the Demand for Labour in Ghana's Manufacturing Sector	1991-1993	Labour demand	Factor prices, capital output	Human capital model; rent sharing model	Rent sharing explains much of the differentials in whilst lack of investment drives the labour demand function down
Teal (1995b)	Does 'Getting Prices Right' Work? Micro Evidence from Ghana	1991-1993	Investment, Exports	Government policies	Descriptive	investments and exports have not responded to policy changes
Teal (1997)	Real Wages and the Demand for Skilled and Unskilled Male Labour in Ghana's Manufacturing Sector: 1991 – 1995	1991-1996	Real wages,	Factor prices,	Translog function	Average real wages have continued to fall but relative wage of skilled labour has risen

Table 5.3: Empirical Studies from RPED, GMES Dataset (Continued)						
Author (s)	**Title**	**Period**	**Variables**		**Methodology**	**Results**
			Dependent	**Independent**		
Teal (1998)	The Ghanaian Manufacturing Sector 1991 -1995: Firm Growth, Productivity, and Convergence	1991-1995	Firm growth and productivity	Capital, labour, education, tenure	Regression analysis	There is no evidence of a rise in underlying productivity over time. No underlying growth in technical efficiency. A high rate of job creation in Ghana's manufacturing sector
Bigsten et al. (1999a)	Exports of African Manufactures: Macro Policy and Firm Behaviour	1991-1995	Decision to export; percentage of output exported	Capital per employee, employment, firm age, any foreign ownership, exchange rate	Regression analysis, Fixed effects, Panel logit	Exporting is associated with larger firms. No significant effect on exports due to changes in the Dollar index.
Bigsten et al. (1999b)	Investments in Africa's Manufacturing Sector: A Four Country Panel Data Analysis	1992-1994	Investment	Profitability, growth of value added, past firm borrowing, size, and age of a firm	Flexible accelerator specification	Manufacturing firms in Africa show very low levels of investment, and a positive effect from profits onto investment was found.

Table 5.3: Empirical Studies from RPED, GMES Dataset (Continued)						
Author (s)	**Title**	**Period**	**Variables**		**Methodology**	**Results**
			Dependent	**Independent**		
Bigsten et al. (2003)	Credit Constraints in Manufacturing Enterprises in Africa	1992-1996	Demand for credit; supply of credit	Size of firm, employment, formal debt to capital, access to overdraft	Probit Model; Fixed effects; Random Effects	Micro and small firms are less likely to access a loan compared to large firms. There is a positive relationship between outstanding debt and further lending.
Pattillo and Söderbom (2000)	Managerial Risk Attitudes and Firm Performance in Ghanaian Manufacturing: An Empirical Analysis Based on Experimental Data	1994-1995	Profits	Managerial risk attitude and uncertainty	An experimental gambling approach, lottery experiment	Firms with more risk-averse managers that face high risks have lower profit rate variability and lower mean profit rates
Söderbom and Teal (2000)	Skills, Investment, and Exports from Manufacturing Firms in Africa	1992-1998	Investment, Exports	Human capital, technical efficiency, firm age	Flexible accelerator specification	Technical efficiency is a significant determinant of both investment and exports

Table 5.3: Empirical Studies from RPED, GMES Dataset (Continued)						
Author (s)	**Title**	**Period**	**Variables**		**Methodology**	**Results**
			Dependent	**Independent**		
Teal (2000)	Private Sector Wages and Poverty in Ghana: 1988 -1998	1988-1998	Real wages	Education, occupation	Regression analysis	A relative rise in the price of skilled labour
Söderbom and Teal (2001)	Are African Manufacturing Firms Really Inefficient? Evidence from Firm-Level Panel Data	1991-1997	Technology; technical efficiency; allocative efficiency	Foreign ownership, age, education	OLS; GMM	Large firms face higher relative labour cost; observable skills do not determine productivity; technical inefficiency is not lower in firms with foreign ownership or older firms
Söderbom and Teal (2004)	Size and Efficiency in African Manufacturing Firms: Evidence from Firm-Level Panel Data	1991 - 1997	Technical and allocative efficiency	Labour, capital, human capital, indirect cost, raw materials	OLS, Fixed Effects, System GMM	Technical inefficiency is not lower in foreign-owned firms or older firms
Frazer (2005)	Which Firms Die? A Look at Manufacturing Firm Exit in Ghana	1991,1993 , 1995, 1997	Firm productivity	Capital, labour, firm age and size	Levinsohn Petrin (2003), Frazer Procedure (2004) and OLS	Firms that go out of business are less productive than surviving firms. Larger firms are less likely to exit.

Table 5.3: Empirical Studies from RPED, GMES Dataset (Continued)						
Author (s)	**Title**	**Period**	**Variables**		**Methodology**	**Results**
			Dependent	**Independent**		
Görg and Strobl (2005)	Spill Overs from Foreign Firms Through Worker Mobility: An Empirical Investigation	1991-1997	Firm productivity	Entrepreneur characteristics; worker mobility	Regression analysis	Firm owners who had worked with multinationals in the same industry prior to starting their own firms are more productive than other domestic firms
Rankin et al. (2006)	Exporting from Manufacturing firms in Sub-Saharan Africa	1991-2002	Export participation	Employment, output, capital and raw materials per employee, employee output, capital,	Linear Probability model; Probit model	Firm size is a key determinant of the decision to export. Evidence for self-selection into exporting is very weak
Teal et al. (2006)	Ghana: An Analysis of Firm Productivity	1996-2002	Productivity; exporting; Investments; labour wages	Capital, employment, education	Regression analysis	Firm efficiency determines investment decisions; firm size is key to exporting and investment; labour productivity differs across firms by size.

Table 5.3: Empirical Studies from RPED, GMES Dataset (Continued)						
Author (s)	**Title**	**Period**	**Variables**		**Methodology**	**Results**
			Dependent	**Independent**		
Waldkirch and Ofosu (2010)	Foreign Presence, Spill Overs, and Productivity: Evidence from Ghana	1991-1997	Labour and Total Factor Productivity	FDI, skilled labour share, Capital	Levinsohn Petrin (2003) System GMM, OLS	The presence of foreign firms has a negative effect on the productivity of domestic firms but a positive effect on most foreign-owned firms.
Ackah et al. (2012a)	Trade, Trade Policy and Total Factor Productivity: The Case of Ghanaian Manufacturing Firms	1993-2002	Total Factor Productivity	Import tariff, capital stock, raw materials, firm age	Levinsohn Petrin (2003) System GMM, OLS	There is a large positive effect of tariff reductions on total factor productivity and a strong effect of export intensity on productivity.
Ackah et al. (2012b)	Wage and Employment Effects of Trade Liberalization: The Case of Ghanaian Manufacturing	1993-2002	Real Wages, Employment	Employment, tariff, output, worker education, wages	Generalized Method of Moments (GMM)	Trade liberalization significantly decreases employment and job creation.

Table 5.3: Empirical Studies from RPED, GMES Dataset (Continued)						
Author (s)	**Title**	**Period**	**Variables**		**Methodology**	**Results**
			Dependent	**Independent**		
Bresnahan et al. (2016)	Does Freer Trade Really Lead to Productivity Growth? Evidence from Africa.	1991-2002	Total Factor Productivity	Capital, material inputs, foreign ownership, exports	Levinsohn Petrin revenue based GMM (2004)	There is a positive relationship between export intensity and productivity.
Abor et al. (2014)	Bank Finance and Export Activities of Small and Medium Enterprises	1991-2002	Profitability, Exports	Bank finance	Probit model	SMEs access to bank finance improves their likelihood to export
Nyantakyi, and Munemo (2014)	Technology Gap, Imported Capital Goods, and Productivity of Manufacturing Plants in Sub-Saharan Africa	1991-2002	Total Factor Productivity	Technology gap, capital goods import	Levinsohn Petrin (2003) Olley-Pakes (1996)	Increasing imports of capital goods and closing technology gap have a significant positive effect on productivity.

Source: Author's own construct.

5.4 Data Cleaning and Testing

An assessment of the original dataset shows a strongly balanced data comprised of 3,564 observations covering 312 firms. Before the data analysis, data on state enterprises were excluded since this thesis has a focus on the private sector. In addition, missing values were dropped from the dataset. Furthermore, bakery sub-sector was not included for reasons of unavailability of tariff data. Further checks on whether the dataset meets basic regression assumptions (Gauss-Markov conditions) led to the exclusion of one severe outlier from the dataset. Additionally, to avoid loss of sample size, there is no insistence on maintaining a balanced-panel data. Consequently, the final dataset consists of an unbalanced panel of 1,173 firm-year observations, made up of 145 firms in four subsectors (i.e. Food and Beverages, Garments, Furniture, and Metal and Machines), covering a minimum of three and a maximum of eleven years (see Table 6.4 for the descriptive statistics). Given that an unbalanced panel is employed, entry and exit decisions of firms are implicitly considered as Van Beveren (2012) notes.

Various tests were also carried out to determine whether the final dataset meets basic tests of panel datasets. These include the unit-root test, heteroscedasticity test, test for serial correlation, and cross-sectional dependence, etc. Since panel data was used in this work, the unit-root test was used as a pre-estimation test to determine if each variable employed is stationary or not. This is particularly important because time series variables that are nonstationary (i.e., contains a unit root) tend to suggest meaningful relationships between variables when in actuality there is none (Gujarati and Porter, 2010). The test was therefore necessary to avoid spurious regression. Specifically, the Fisher-type test based on Phillips–Perron unit-root test was preferred because it was suitable for the unbalanced dataset that also contained gaps. In addition, the Phillips–Perron unit-root test has been observed to be robust to serial correlation as well as heteroscedasticity. The Z statistic of the inverse-normal is presented as recommended by Choi (2001) for use in applications because it offers the best trade-off between size and power. A similar test, the Im–Pesaran–Shin test, which is also used to perform a unit root test for an unbalanced panel was not utilized in this work since it does not allow for gaps in the dataset as is the case with the current data. The null hypothesis of the Fisher-type Phillips–Perron unit root test (H_0) is: All panels contain unit roots, while the alternative hypothesis (H_a) is: At least one panel is stationary. Based on the results obtained, we can reject the null hypothesis (since a p-value < 0.05 was obtained) and conclude that the

dataset is stationary. In other words, each variable used follows a stationary process. The results for this test are presented in Table B.2 in Appendix B.

Further, the Modified Wald test for group-wise heteroscedasticity in fixed effect regression model was employed to test for heteroscedasticity in the dataset. The null hypothesis (H_0) is homoscedasticity (or constant variance). Since a p-value of 0.0 was obtained, which is lower than the significance level (0.05), it was concluded that heteroscedasticity was present in the dataset. Thus, heteroscedastic-consistent robust standard errors were employed in the tariff-TFP regressions. Also, if serial correlations (also known as autocorrelation) are not identified and corrected in panel data, the standard errors could be biased and therefore lead to less effective results. The Wooldridge test for autocorrelation in panel data was therefore utilized to test for serial correlations. The null hypothesis, H_0 (no first-order autocorrelation in the dataset) was accepted because the p-value of 0.00 obtained was lower than the level of significance (0.05). Hence, it was concluded that first-order autocorrelation was present in the dataset. The STATA command (*xtreg*) with standard errors clustered at the firm-level is therefore employed to obtain standard error estimates that are robust to disturbances being heteroscedastic and autocorrelated (Hoehle, 2007).

5.5 Limitations of the Data

As mentioned earlier, the first sample was taken from the 1987 industrial census and therefore excludes any firm that might have been in existence after the census and this is a source of a potential sample bias. It is also assumed in this work that firms operating in Ghana's free zones were not part of the dataset. An assumption if not true, could lead to an overestimation of the tariff effect on firm performance since these firms enjoy tariff exemptions on imported materials, among others. Finally, the NPM measure does not include tax and interest payments since such data is not available in our dataset and could result in an overestimation of the net profit margins

6 MEASURING FIRM PERFORMANCE AND DESCRIPTION OF VARIABLES

In this chapter, the performance measurement indicators employed in this thesis as well as the operationalization of variables for the analysis of tariff effects on firm productivity and profitability are presented. These effects are then analyzed using regression analysis in STATA 15 (see Chapter 8). The chapter also includes the descriptive statistics of the variables employed.

6.1 Performance Measurement

Two major performance indicators, namely productivity and profitability have been employed in this thesis to measure firm-level performance. "Productivity is commonly defined as a ratio of a volume measure of output to a volume measure of input use" (OECD, 2001:11). Profitability, on the other hand, is "the ability of a firm to generate earnings" (Gibson and Boyer, 1979:189). In this study, the performance indicators were analyzed at the firm-level. This is because it allows for the examination of a greater level of variety occurring at the lower level, which macro data is unable to unmask. Another advantage with using firm-level data is that a closer analysis of the relationship between various economic variables can be carried out; therefore, giving insights into what characterizes successful firms. This cannot be observed or assessed with macro-level data. It also makes it possible to isolate the productivity effects of factors such as firm age, foreign ownership, etc. on individual firms (Robjohns and Clayton, 2007). This is especially important; because, knowing the productivity effects of these factors help to ascertain the true impacts of tariffs on firm performance since such factors significantly affect the performance gains associated with the internationalization of firms (Bausch and Krist, 2007). In a nutshell, the reliance on firm-level panel data is much richer in analyzing heterogeneity across firms and therefore offers a better understanding of the causes of performance differences. Consequently, as Saliola and Seker (2011) notes, such knowledge allows for the designing of policies to improve productivity, and subsequently lead to growth.

6.1.1 Measurement of Total Factor Productivity

Total Factor Productivity (TFP) is defined as "the efficiency with which firms turn inputs into outputs" (Saliola and Seker, 2011:1). It is therefore a measure of efficiency, hence an important indicator to policy makers. There are two key methods by which TFP is measured and these are the gross-output and value-added methods. However, only the gross output approach of measuring TFP has been employed in this work. A major advantage of the gross output approach over the value-added approach is that while a number of inputs such as labour, capital, and intermediate inputs are used in the former, only two factor inputs, including labour and

capital are used in the latter. Thus, owing to the fact that intermediate inputs such as energy and materials, are a key input component of this thesis because they form a greater part of the cost structure of manufacturing firms, and also because tariffs effect on the number of intermediate inputs used in production is of prime importance to this study, the gross output approach was employed. Another key strength of the gross output approach is that the use of intermediate inputs makes it possible to capture the complete picture of the production process (Sichel, 2001). Additionally, some biases in productivity measurement resulting from an incomplete definition of productivity and biases resulting from an improper allocation of productivity to industries can be minimized with this approach (Gullickson and Harper, 1999).

Furthermore, Gullickson (1995) and Jorgenson et al. (1987) showed that intermediate inputs are the predominant source of the output growth at the industry level, exceeding both productivity growth and the contributions of capital and labour in the large majority of industries. Unlike the value-added method which is observed to have higher estimated coefficients and could thus overestimate productivity, the gross output approach does not have such a challenge (Gandhi et al., 2017). This is because the denominator of the value-added approach is smaller as compared to the gross output approach that includes intermediate inputs (e.g., energy, materials) besides the two factor inputs of capital and labour as utilized with the value-added method. This can be explained in detail with the illustration of Diewert and Nakamura (2007). In other words, the productivity in the gross output approach can be given as:

$$\frac{\mathrm{Y}}{(\mathrm{E}+\mathrm{M}+\mathrm{L}+\mathrm{K})} \qquad (6.1)$$

Whereas that of the valued-added method is given as:

$$\frac{(\mathrm{Y}-\mathrm{E}-\mathrm{M})}{(\mathrm{L}+\mathrm{K})} \qquad (6.2)$$

Where: Y = gross output; E = Energy; M = Materials; L = Labour and K = Capital

Hence, given that a positive change in the gross output, Y, is considered as an improvement in productivity, the productivity growth rate when all other inputs are constant in the case of the gross output approach is given as:

$$\frac{\left\{(Y+\Delta Y)\Big/(K+L+E+M)\right\}}{Y/(K+L+E+M)} = (Y+\Delta Y)/Y = 1+(\Delta Y/Y) \qquad (6.3)$$

In the case of the value-added approach, Eq. (6.3) can be given as:

$$\frac{\left\{(Y+\Delta Y-E-M)\Big/(K+L)\right\}}{\{(Y-E-M)/(K+L)\}}=1+\{\Delta Y/(Y-E-M)\} \qquad (6.4)$$

From Equations (6.3) and (6.4), it can be observed that the estimated productivity growth in the value-added approach is higher than that obtained from the gross output approach. This is explained by the exclusion of intermediate inputs in the value-added method, resulting into a smaller denominator as compared to the outcome of the gross output, therefore translating into a higher productivity growth. Hence, it can be concluded that the gross-output measure provides the true picture of improvements in productivity. Therefore, the gross output concept is preferred in this thesis as it serves as "a better indicator of the full extent of disembodied technological change" (Cobbold, 2003:2).

6.1.2 Measurement of Profitability

The aim of every firm is to maximize profit; hence, profitability is very important to firms because without profitability, a firm will not survive in the long term (Hofstrand, 2009). The profitability of a firm is thus a measure of its success. Therefore, measuring profitability is a primary goal of every firm. Profitability is defined as the "ability of a given investment to earn a return from its use" (Howard and Upton, 1961:147). In other words, "it reflects a company's competitive position in the market, and by extension, the quality of its management" (Robinson et al., 2009:291). According to Hofstrand (2009), profitability can be defined in two ways, accounting profit or economic profit. Accounting profit provides an intermediate perspective on the viability of a business whilst economic profit provides the long-term view. Economic profit is therefore the ability of a firm to generate sufficient returns on the capital and employees that is used in its operations. The profitability analysis carried out in this study is based on the concept of economic profits because it takes care of not only business expenses but also those relating to labour and management ability (Hofstrand, 2009). Therefore, standard profitability ratios based on the concept of economic profits are employed in measuring profitability. According to Robinson et al. (2009:277), "Profitability ratios measure the company's ability to generate profitable sales from its resources (assets)". In other words, profitability ratios measure the return that a company earns during a particular period of time. Specifically, ratios of Gross Profit Margin (GPM)[17], Net Profit Margin (NPM) and Gross Profit per Employee

[17] The calculations of GPM and NPM are as defined in Robinson et al. (2009).

(GPE) are employed. Profit margins have been employed because they are more accurate in reflecting the long-term profitability of firms and for easy comparability across firms.

The GPM, also known as gross profit ratio, is the ratio between gross profit and sales. It therefore measures the efficiency of a firm's operation and also shows the average spread between its operating cost and revenue. In this study, revenue is used in place of sales. The GPM is given as:

$$GPM = \frac{Gross\ Profit}{Revenue} \times 100 \qquad (6.5)$$

Following Tamminen (2017), Gross Profit (GP) is given as the difference between revenue and cost and calculated as:

$$GP = Revenue - Variable\ cost \qquad (6.6)$$

Where revenue represents annual revenue and variable cost (VC), also known as cost of goods sold pertains to costs such as materials and labour costs and does not include fixed cost such as rent. On the other hand, the NPM is expressed as the relationship between net profits and sales or revenue. Hence, it serves as a measure of management's ability to operate the firm with success such that it does not only recover revenue but also earns a reasonable margin of compensation for its owners. The NPM in this case is determined as:

$$NPM = \frac{Net\ income}{Revenue} \times 100 \qquad (6.7)$$

Where Net Income (NI) is given in this case as:

$$NI = Revenue - variable\ cost - fixed\ cost - trade\ cost \qquad (6.8)$$

Fixed cost here refers to all cost not captured in the GPM estimator such as rent, cost of land, transport etc. In this case, the indirect materials cost variable in the dataset captures the fixed cost. Trade cost is the tariff paid on imported materials, given as tariffs multiplied by the value of material import. It is therefore zero for firms that do not import any material input. The NPM measure does not include corporate tax and interest payments since such data is not available in our dataset.

Profit per employee has become a critical measure of firm performance in recent times, because of the belief that the thinking-intensive talent is what drives the creation of wealth today and therefore "deserves to be measured more precisely by strategically minded executives" (Bryan, 2007:9). Therefore, managers or companies have been called upon to adopt performance measurement approaches that are based on maximizing the returns on people – profit per

employee. In other words, companies must not only focus on the returns on capital alone but also on the returns on talent – deemed as the real engines of wealth creation (Bryan, 2007). For this reason, we include the gross profit per employee in our profitability analysis. The GPE measures the profit generated by each labour employed. Unlike the GPM and NPM, the GPE is expressed in monetary terms. In line with the gross profit estimation in equation (6.6), gross profit per employee is calculated as:

$$GPE = \frac{Gross\ Profit}{Number\ of\ employees} = \qquad (6.9)$$

6.2 Operationalization of Variables

The variables of interest to this study were categorized into three as follows: (1) dependent variables (also called the performance indicators), (2) variables for the production function estimation, and (3) explanatory variables employed for the analysis of the tariff effects on firm productivity. In Table 6.1, the performance indicators (also used as the dependent variables) in this work have been presented and described. It can be seen from the table that productivity is measured via the total factor productivity (gross output) whilst profitability is measured using the following: gross profit margin, net profit margin and gross profit per employee. Also presented in the table are the corresponding units of measurement and the variable names as used in STATA.

Table 6.1: Performance Indicators and Dependent Variables.

Performance Indicator	**Dependent Variable**	**Description**	**Unit of measurement**	**Variable name on Stata**
Productivity	Total factor productivity	The difference between actual output and the predicted output. Gross output estimation: Output and the combined inputs: (labour, capital, intermediate inputs)	GHS (natural logarithm)	lnTFP
Profitability	Gross profit margin	{(output – materials cost – gross wages)/output} *100	Percentage	ln GPM
	Net profit margin	{(output – materials cost – indirect materials cost – gross wages -tariff paid/ output)} * 100	Percentage	ln NPM
	Gross profit per employee	(output – materials cost – gross wages)/number of employees)	GHS	ln GPE

Source: Author's own construct.

Table 6.2 presents the description of variables used in the computation of the production function and firm-level productivity. Capital and labour are the primary inputs whilst raw materials cost constitutes the intermediate input for the estimated production functions. In addition, the real indirect cost has been used for the estimation of an alternative productivity measure, where real indirect cost serves as a proxy for productivity shocks instead of materials cost for the purposes of checking the robustness of the results. Real output is given as firm revenue that is deflated by firm-specific price deflators that were provided by the survey team[18]. Capital is given as the replacement value of the stock of plants and machinery, assuming a depreciation rate of 2%. Raw materials serve as a measure of intermediate input, determined as the total cost of raw materials input per year and constructed with firm-specific material price indices by the survey team. Labour input is often proxied by the number of employees, that is headcount in the literature. However, Zhan et al. (2018) opined that this measure of labour input ignores improvements in the quality of labour over time. Therefore, the proxy for labour input herein pertains to the monetary expenditure on labour, that is, labour cost[19]. In other words, compensation of employees and payments to labour expressed in monetary terms is used as the measure of labour. Specifically, we employ real annual wages including allowances as the labour input. Because the natural log of zero is undefined[20] and about 7.9% observations of the wage variable were zero values, the real wage variable was transformed using the inverse hyperbolic sine transformation[21] in order to capture firms with zero wages for some periods.

Table 6.2: Description of Variables for the Production Function.

Variables	**Description**	**Variable name in Stata**
Real Output	Real value of a firm's total production	ln real output
Real Capital	Real replacement cost of plant and machinery	ln capital
Labour	Real annual wages of employees	ln labour
Raw Materials	Real value of a firm's raw material cost	ln materials
Real indirect cost	Real cost of electricity, water, transport, phone, fuel etc.	ln indirect cost

Source: Author's own construct.

[18] The survey team constructed the price deflators based on information the gathered on each firm's products and their prices (see Teal, 2011).

[19] Other studies employing labour cost as proxy for labour input include Seker and Saliola (2018) and Zhan et al. (2018).

[20] This is because the natural log function is defined only for values greater than zero.

[21] The inverse hyperbolic sine transformation was proposed by Johnson in 1949. See Appendix C.1.

The values of all variables expressed in monetary terms (e.g. real output, capital, materials, indirect cost, labour cost etc.) are given as 1991 Ghanaian cedis. Therefore, the output and inputs of the production function are all in monetary terms, hence measured in the same unit. This is especially important because as Dey-Chowdhury et al. (2007:50) opine, for productivity "analysis to provide useful statistical or policy conclusions, inputs must be measured on the same basis as the outputs".

The description of the independent variables for the tariff-productivity analysis as well as their expected sign effects on the performance indicators is presented in Table 6.3. From the literature, as presented earlier in Chapter 4, lower tariffs have a positive effect on productivity and vice versa (Luong, 2011; Amiti and Konings, 2007), indicating that declining tariffs induces higher productivity whilst increasing tariffs results in lower productivity. Therefore, the tariff variable is expected to have a negative sign as shown in Table 6.3. In terms of profitability, the general presumption is that increased import competition via less trade barriers due to lower tariff rates will lead to a decline in profits for domestic firms whereas higher tariffs will be accompanied by higher profits owing to the fact that increased foreign supply pushes down the prices of products (Xu, 2012). Nevertheless, similar to our tariff productivity expectations, a negative sign is envisaged when the effect of tariffs on profitability is considered. This is because lower tariffs can lead to improvements in productivity, and more productive firms are expected to earn higher profits (Melitz, 2003). The resulting effect is therefore that lower tariffs will cause increases in profits whilst higher tariffs results in lower profits. In particular, importing firms are expected to enjoy higher benefits from lower tariffs due to the foreign technology embodied in inputs as a result of easy accessibility and variety in comparison to non-importers (Amiti and Konings, 2007). Hence, an interaction of the import share of importing firms and tariffs has been included to capture such an effect. It also assesses the differences in impact level that arises in firms with different levels of imported inputs. A negative sign is expected for such an interaction term since lower tariffs increase access to foreign inputs and therefore firms with high raw materials imports are expected to have higher performance via the technology embodied in them. A similar effect is envisaged in the case of firm profitability as depicted in Table 6.3.

Table 6.3: Description of Explanatory Variables and their Expected Signs on the Performance Indicators.

Explanatory Variables	Description	Expected Sign on Performance Indicators		Variable Name on Stata
		Productivity	Profitability	
Tariffs	Average bilateral tariff rates	-	-	ln Tariff
Import status	Dummy if firm imports raw materials (1 = firm imports and 0 = firm does not import)	+	+	Imports
Tariffs & import dummy interaction	Tariffs * import dummy	-	-	ln Tariffs*Imd
Import share	Share of raw materials imports in firm's total materials (i.e. total materials import per firm and year/firm's total materials)	+	+	ln Im_share
Tariffs & import share interaction	Tariffs * import share	-	-	ln Tariffs*Ims
Export status	Dummy if firm exports or not (1 = firm exports and 0 = firm does not export)	+	+	Exports
Export share	Share of exports in total output (i.e. Output exported/total output)	+	+	ln Ex_share
Ownership type	Dummy for Foreign, Ghanaian and mixed (private firms)[22]	+ + +	+ + +	Foreign Ghanaian & Mixed
Foreign share	Percentage of foreign ownership	+	+	foreign share
Firm Size	Number of employees (total employment level of firm)	+	+	firm size
Exit	Dummy if firm exits or remains	-	-	exit

Source: Author's own construct.

In general, firms engaged in international trade are said to perform much better than their domestic counterparts since they accrue gains via learning to import or export etc. According to Greenaway and Kneller (2007), exporters are more productive than non-exporters. Fryges

[22] However, foreign ownership is expected to have much higher effect on the performance indicators, followed by mixed ownership and then domestic.

and Wagner (2010) also posit that exporting has a positive effect on profitability due to learning by exporting from foreign customers and competitors as well as scale effects accrued via access to larger markets than national markets. Such a gain, according to them could also result from monopoly rents earned through firm-specific advantages obtained from more than one market. Furthermore, De Loecker (2011) opines that firms that engage in international trade either via exporting or Foreign Direct Investment (FDI) have higher measured productivity. For these reasons, the export or import status of firms is expected to have a positive effect on both productivity and profitability as shown in Table 6.3. Indeed, exporting firms are expected to be more productive than importing firms. For example, the European Central Bank (ECB) asserts that "the most recent theoretical international trade literature predicts that exporters are the most productive firms in an economy" (ECB, 2017:84).

Furthermore, firm characteristics play a key role in determining the performance of firms. Variables such as firm size is said to significantly affect the performance gains associated with internationalization of firms (Bausch and Krist, 2007). In other words, the type of ownership, and size of firms influence firm performance. These characteristics determine a firm's access to finance or new technology, incentive structure for workers and the ability of firms to enter new markets which in turn affect firm performance. For instance, foreign owned firms are said to have higher productivity in comparison to their domestic counterparts (Amiti and Konings, 2007). Therefore, foreign owned private firms are expected to have a much positive effect on the performance indicators, followed by mixed owned firms and lastly domestic firms.

The size of a firm, measured here as the total number of employees, greatly affects a firm's productivity and profitability. For instance, the entering cost of smaller firms into international markets are generally higher than for bigger firms and therefore, most firms that are able to engage in international trade are large in nature. These firms are also usually better performing, in other words, larger firms are more productive as opined by Francis and Honorati (2016). Therefore, larger firms are estimated to have more positive effects on performance indicators than smaller firms. Finally, an exit variable has been included to capture the effect of exiting firms as well as reduce selection bias. It is postulated that less productive firms will exit the market whilst more productive ones remain (Melitz, 2003; Jovanovic, 1982). Therefore, firms in the current study that exit are expected to be less productive than the ones that survive.

6.3 Descriptive Statistics

The summary statistics for the key variables employed are presented in Table 6.4. It can be observed that the average (or mean) total factor productivity of all firms (lnTFP) is approximately 3.2% and that of fully owned Ghanaian firms is about 1.5% over the study period. Also, the average gross profit margin is about 4% whereas the average net profit margin stands at 3.3%.

Table 6.4: Summary Statistics.

Variable	Obs	Mean	Std. Dev.	Min	Max
lnTFP_All firms	1,173	3.223421	8.225197	-17.8677	12.45652
lnTFP_Ghanaian firms	971	1.570898	6.922536	-10.26449	11.79797
lnGPM	1,173	3.960326	1.546865	-5.338612	5.270467
lnNPM	1,173	3.269573	2.128399	-5.51688	5.2412
lnGPE	1,173	12.61233	4.996613	-13.8052	17.67135
ln Tariff	1,173	2.790133	.4110868	1.258461	3.795714
Imports	1,173	.4211424	.4939529	0	1
ln Tariffs*Imd	1,173	1.159885	1.386696	0	3.795714
Exports	1,173	.1057118	.3075996	0	1
ln Im_share	1,173	1.634134	2.000136	0	4.60517
ln Ex_share	1,173	.2714262	.9743342	-4.60517	4.60517
ln Tariffs*Ims	1,173	4.49734	5.611353	0	17.47991
ln gross output	1,173	16.94895	2.117587	10.37374	22.62197
ln materials	1,173	16.13828	2.136293	7.140329	21.60918
ln indirect cost	1,173	14.09796	2.633965	7.931189	21.79897
ln capital	1,173	15.82095	3.047363	9.53537	23.63831
ln wages	1,173	14.29481	4.693283	0	21.336
Ghanaian	1,173	.827792	.3777222	0	1
Foreingn	1,173	.0230179	0.1500242	0	1
Mixed	1,173	.1491901	.3564277	0	1
Any Foreign	1,157	.1745895	.3797797	0	1
Exit	1,173	.0392157	.1941905	0	1
ln firm size	1,173	3.063998	1.260732	0	6.242223
Accra	1,173	.5592498	.4966888	0	1
Cape Coast	1,173	.0323956	.1771238	0	1
Kumasi	1,173	.3546462	.47861	0	1
Takoradi	1,173	.0537084	.2255376	0	1

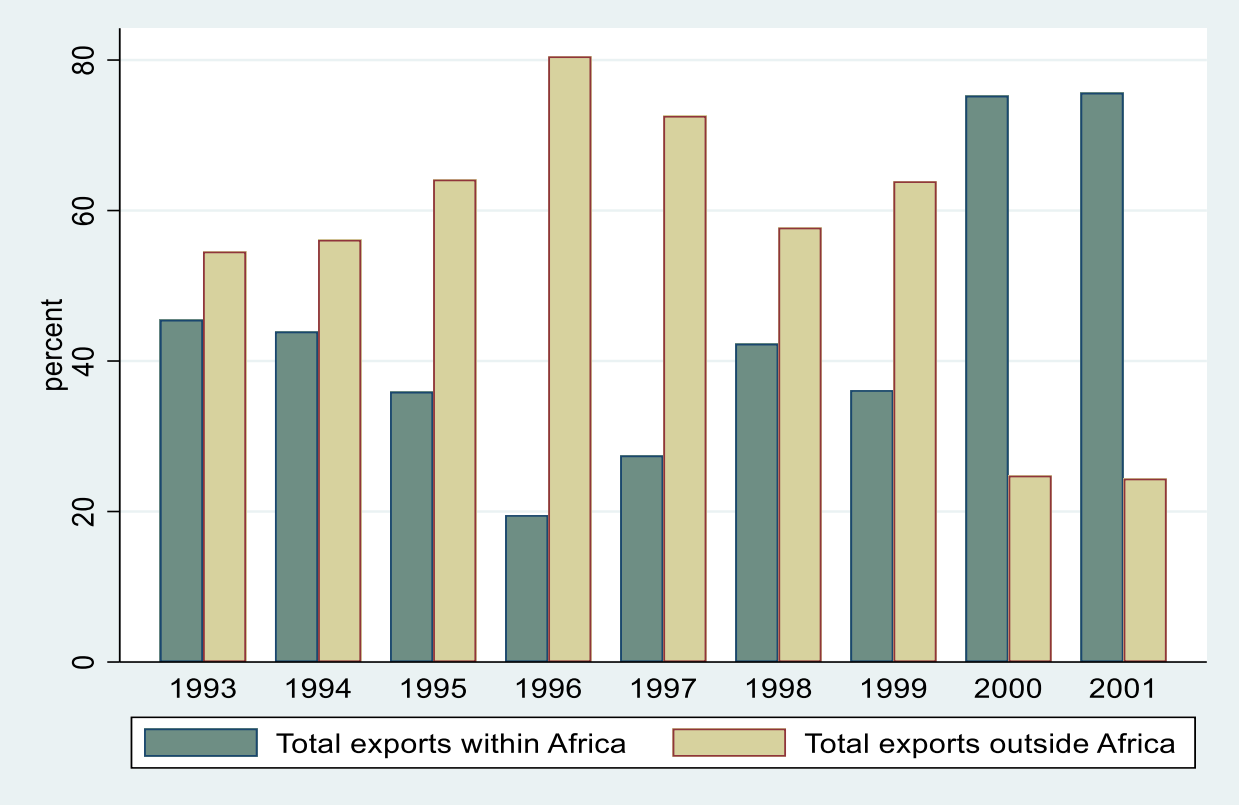
Note: Foreign + Mixed = Any foreign. Hence, either Ghanaian + Any foreign = 1 or Ghanaian + Foreign + Mixed = 1.

Source: Author's construct from RPED, GMES dataset.

Generally, irrespective of the profitability measure employed, average profits are non-negative, signalling that firms in the dataset are profitable over the period considered. On average, about 3% of firms exited the market within the 1991 to 2001 period. In terms of imports, about 42% of firms import raw materials and an average of 10% were engaged in exports during the periods considered. The import and export outcomes are characteristic of developing countries, that engage more in importing than exporting.

In Figure 6.1, the output exported from Ghana to the world and other African countries from 1993 to 2001 are presented. Generally, exports to the world were much higher over the period except for the years 2000 and 2001, where majority of exports were to African countries. Probably, because of the keen interest and commitment in increasing intra-African trade by African leaders with policies such as the ECOWAS trade liberalization scheme.

Figure 6.1: Manufacturing Output Exported Outside and Within Africa from Ghana in Percentages (1993 – 2001).

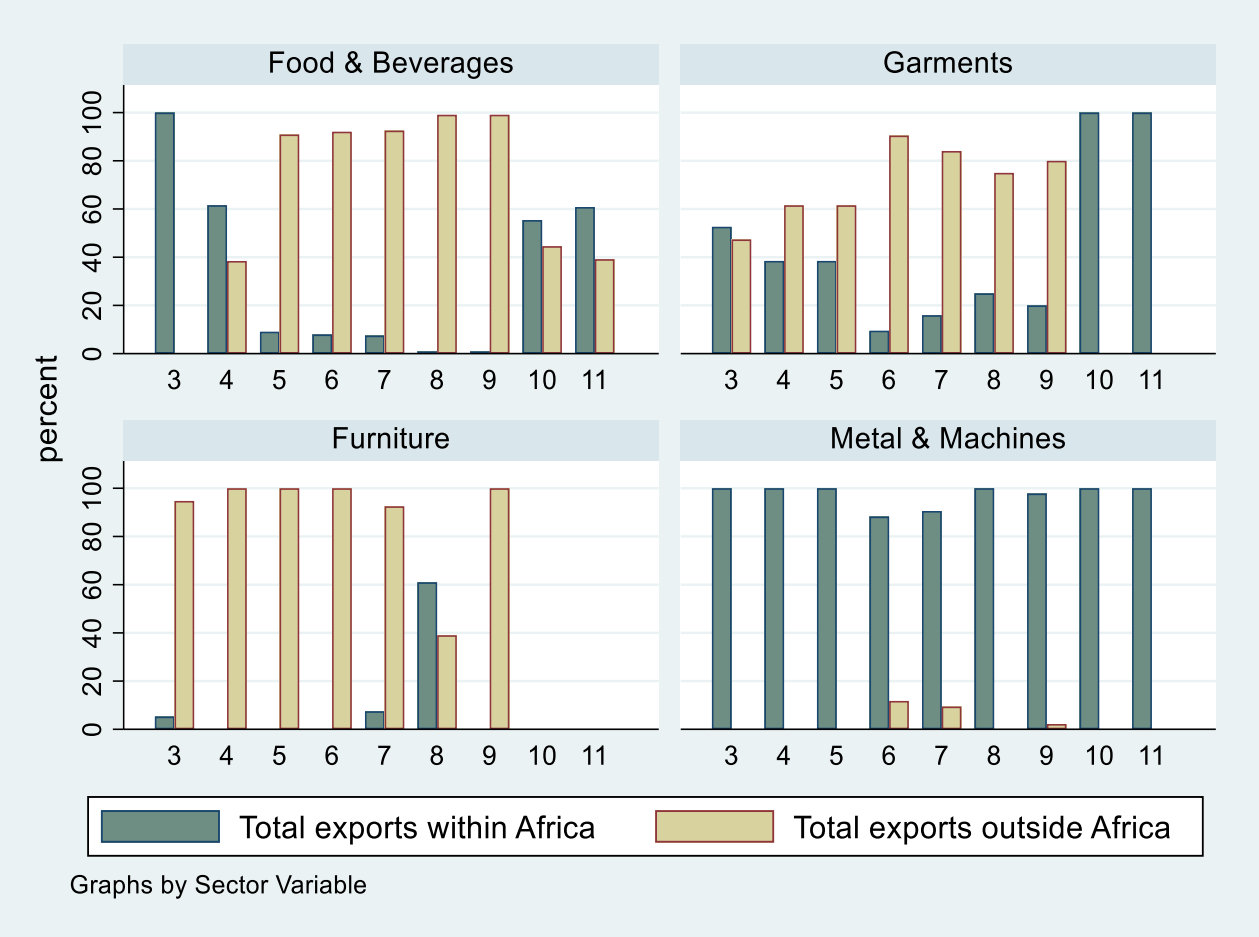


Source: Author's construct from RPED, GMES dataset.

The degree of output exported from the manufacturing sector in Ghana both within and outside Africa based on the four subsectors is reported in Figure 6.2. It can be observed from the figure that exports of the metal and machines subsector are mainly to other African countries. On the

other hand, exports in the furniture subsector are largely outside Africa. Also, with regards to the garments subsector, exports were in general outside Africa until 2000 when exports within Africa saw a major rise. In contrast, exports in the food and beverages subsector was initially concentrated within Africa but has since shifted to outside Africa in the beginning of 1995.

Figure 6.2: Manufacturing Output Exported Outside and Within Africa from Ghana in Percentages (1993 – 2001) by Sector.



Source: Author's construct from RPED, GMES dataset.

7 ESTIMATION OF ECONOMETRIC MODELS

This chapter presents the empirical models used for the estimation of the productivity and profitability effects of trade. It begins with the production function estimation and ends with the regression equation for the profitability analysis. The empirical estimation does not strictly follow the Melitz (2003) model presented in Chapter 4 due to the absence of data on product varieties in the current dataset. Therefore, a standard Cobb-Douglas production function is employed in the empirical analysis as done in the literature.

7.1 Empirical Model and Estimation of Productivity Effects of Trade

Following Van Beveren (2012), a two-stage approach is applied in the productivity analysis. First, firm-level total factor productivity is estimated based on a production function using Levinsohn-Petrin (2003) methodology, after which the effects of tariffs on total factor productivity is examined. For a start, a Cobb-Douglas production function of the form given below is considered:

$$Y_{ijt} = A_{ijt} L_{ijt}^{\beta_l} K_{ijt}^{\beta_k} M_{ijt}^{\beta_m} \qquad (7.1)$$

Where Y_{ijt} is the real gross output in firm *i* at time *t* of sector *j*; (L_{ijt}), (K_{ijt}), (M_{ijt}) represent labour, capital, and materials respectively for firm *i* in time *t* and sector *j*; A_{ijt} is the Hicksian neutral efficiency level of the firm *i* of sector *j* in time *t* and said to be unobservable to the researcher. Taking the natural logarithm of equation (7.1), the following log-linear equation is obtained:

$$y_{ijt} = \beta_0 + \beta_l l_{ijt} + \beta_k k_{ijt} + \beta_m m_{ijt} + \varepsilon_{ijt} \quad (7.2)$$

Where the natural log of the Hicksian neutral efficiency is given as $ln(A_{ijt}) = \beta_0 + \varepsilon_{ijt}$. The subscripts *i, j* and *t* denote firm, sector and time (in years) respectively and ε_{ijt} is the time varying error. The dependent and input variables are in natural logarithm (i.e. the small letters denote that variables are in natural logarithm); hence the input coefficients represent input elasticities. β_0 represents a measure of the mean efficiency level across firms and over time and $\beta_l,\ \beta_k,\ and\ \beta_m$ are the coefficients for labour, capital, and materials respectively. The time varying error component, ε_{ijt}, can be decomposed into two components as observable and unobservable. As a result, equation (7.2) can be rewritten as follows:

$$y_{ijt} = \beta_0 + \beta_l l_{ijt} + \beta_k k_{ijt} + \beta_m m_{ijt} + v_{ijt} + u_{ijt}^{q} \quad (7.3)$$

where $\omega_{ijt} = \beta_0 + \upsilon_{ijt}$ represents firm level productivity, β are the coefficients to be estimated and u_{ijt}^{q} is an i.i.d. component that refers to the unexpected deviations from the mean resulting from measurement errors and other external factors. It is thus seen as the true error, which can contain both unobserved, and measurement errors (Arnold, 2005). Estimating equation (7.3) allows for ω_{ijt} to be solved, such that the estimated productivity can be determined via the following equation:

$$\widehat{\omega}_{ijt} = \hat{\upsilon}_{ijt} + \hat{\beta}_0 = y_{ijt} - \hat{\beta}_l l_{ijt} - \hat{\beta}_k k_{ijt} - \hat{\beta}_m m_{ijt} \qquad (7.4)$$

Where: $\widehat{\omega}_{ijt} = \text{TFP}_{\text{ijt}}$

Thus, firm level productivity is measured as the difference between its actual output and the predicted output. In other words, TFP is obtained as the residual from the production function estimation. $\hat{\beta}_l, \hat{\beta}_k \; and \; \hat{\beta}_m$, are the estimated factor elasticities for labour, capital and materials respectively. The estimated TFP equation allows for the evaluation of the impacts of various policy variables at the firm level (Van Beveren, 2012). Hence, the effects of trade policy on firm performance can be analyzed based on the productivity results from equation (7.4). To determine the influence of the key trade policy instrument, tariffs, on firm productivity, the following equation is estimated:

$$\ln \text{TFP}_{ijt} = \alpha_0 + \alpha_1 lnT_{jt} + \beta' X_{it} + \alpha_i + \alpha_t + \varepsilon_{ijt} \qquad (7.5)$$

Where: ln TFP_{ijt} is determined from equation 7.4 and refers to the log total factor productivity at the firm level. T refers to Tariff, the key trade variable of interest in this study, given as the average bilateral tariff at the International Standard Industrial Classification (ISIC) 3-digit level. X_{it} = vector of firm characteristics (firm ownership type – that is if a firm is fully owned by a Ghanaian, under the control of a foreigner or mixed ownership of both Ghanaians and foreigners, firm size is measured as the log of the number of employees of each firm), α_t =time specific effect; α_i = firm specific effect; ε_{ijt} = unobserved productivity; α and β' = parameters to be estimated. The year effect has been included to absorb shocks in the economy such as technological changes that might affect productivity.

In line with trade stylized facts in the literature and the objectives of this thesis, the effects of other trade variables such as import, or export status of firms have also been assessed with the equation below:

$$\ln \mathrm{TFP}_{ijt} = \alpha_0 + \alpha_1 lnT_{jt} + \alpha_2(\ln Ex\_share) + \alpha_3\left(lnT_{jt} \times \ln Im\_share\right) + \alpha_4\left(lnT_{jt} \times imports\right) + \alpha_5(\ln Im\_share) + \alpha_6(imports) + \alpha_7(exports) + \beta' X_{it} + \alpha_i + \alpha_t + \varepsilon_{ijt} \qquad (7.6)$$

Where *lnEx_share*= the log of the share of a firm's export to output; *lnIm_share* = the log of the share of raw materials imported; lnT_{jt} * *lnIm_share* is the interaction of log tariff and log import share; imports refers to import dummy variable, exports refer to the export dummy variable and all other variables are as previously defined in equation (7.5).

A direct estimation of equation 7.3 by simple OLS is problematic since it ignores fixed effects, as well as input and output endogeneity and selection bias arising from firm entry and exit (Harris and Moffat, 2015). A key assumption of the OLS is that the independent variables must not correlate with the error term, an assumption often knowns as "the orthogonality of the error term with the regressor" (Antonakis et al., 2010:1089). In other words, to estimate equation (7.3) via OLS, the inputs of the production function must be exogenous, that is, they must be determined independently from the efficiency levels of the firm. However, this is not the case in practice, because Marschak and Andrews Jr. (1944) opine that the choice of the quantity of a firm's inputs is dependent on a firm's knowledge of its characteristics or for instance on the amount of profit a firm envisages. This implies that the independent variables are endogenous, that is they correlate with the error term, leading to the problem of endogeneity. Hence, estimating (7.3) using OLS gives rise to a simultaneity bias. Endogeneity of input choice, or simultaneity bias is simply said to be the correlation between the level of inputs chosen and unobserved productivity shock (De Loecker, 2007). The simultaneity bias stems from the fact that the ω_{ijt} is unobserved by the econometrician but known to the individual firms. For instance, more productive firms could employ more labour and/or invest in capital based on either higher current or anticipated future profits. This could result in the input coefficients of the OLS estimation of the function to be higher than their true values (Pavnick, 2002). In other words, the OLS estimates tend to be biased (Van Beveren, 2012) either upwards or downwards and inconsistent in this case, which can lead to incorrect inferences and may result in conclusions that are misleading as well as providing theoretical interpretations that are inappropriate (Ullah et al., 2018).

The most popular solutions proffered over the years to solve the problem of endogeneity have been instrumental variables (IV) and proxy variables approach (Galvao et el., 2017). The use

of the IV method in practice has however been very limited due to the extreme difficulty in obtaining appropriate instruments. Hence, Ackerberg et al. (2007) assert that the IV method has performed poorly in practice. Therefore, semi-parametric methods, that is the proxy variables approach developed by Olley-Pakes (1996) and Levinsohn-Petrin (2003) have been considered to offer better solutions to the simultaneity and selection biases inherent in the OLS estimator. In both methods, input variables are used as proxies to control for unobserved productivity but differ in the type of proxy employed. Whereas the Olley-Pakes (OP) uses investment as a proxy, the Levinsohn-Petrin (LP) uses intermediate inputs (materials, energy or both) instead. Until now, the OP has been the only method, accounting explicitly for the exit decisions of firms, completely resolving the selection bias that arises from ignoring such decisions (Van Beveren, 2012). Nonetheless, practically, the LP estimator has been widely used since most firms often report periodic data for intermediate inputs, hence allowing for a greater number of observations to be examined with this approach. Following this and as explained later, the current study employs the LP estimator to correct for the simultaneity bias. The method and its merits are discussed later in the subsequent paragraphs.

A firm may choose to stay or exit the market based on its knowledge of its productivity, ω_{ijt}. Such knowledge also affects its decisions with respect to hiring of labour, purchase of materials, and investment in new capital (Pavnick, 2002). In other words, selection bias also known as endogeneity of attrition results in a negative correlation between ε_{ijt} and K_{ijt}, leading to a downward bias of the capital coefficient (Van Beveren, 2012). Consequently, TFP estimates are biased upwards if the exit rule of a firm is ignored (Van Beveren, 2012). However, by employing an unbalanced panel in the current study, we implicitly take into account selection bias. Additionally, we control for the exit of firms in our productivity analysis, explicitly dealing with the endogeneity of attrition problem in our study.

Another methodological problem associated with the estimation of TFP is the omitted output price bias. Such a price bias emanates from the use of deflated sales in place of quantities of output in empirical studies. The standard practice in the literature has often been the use of deflated firm level revenues as proxy for physical quantity, which is mostly not observed (De Loecker, 2011). As such, to eliminate price effects, firm level sales or revenue are often deflated using industry level price index, rather than firm-level prices (De Loecker, 2011). However, this introduces an omitted price bias. This is because if inputs are correlated with prices, then the coefficients of the production function will be biased. For instance, TFP

estimates are biased upwards, due to an under-estimation of firm input use, as a result of using industry levels prices, if firms negotiate lower prices for a given input (Van Beveren, 2012). At the moment however, Van Beveren (2012) notes that there is no formal solution to such a bias in the absence of firm-level price data. Thankfully, the dataset employed in this study contains firm-specific prices, thereby eliminating the omitted price bias.

As mentioned earlier, a two-step estimation procedure has been employed in estimating firm level productivity. In the first step, the semi-parametric approach of Levinsohn-Petrin (2003) is used in estimating equation 7.3. Although the OP method has the capability of resolving both the simultaneity and selection biases inherent in the TFP estimations (Van Beveren, 2012), the usage of only non-zero investments per period, however limits the sample size or observations to be included as a lot of firms neither invest nor have positive investments annually. In other words, missing or zero investments are common trends in real data. The absence of strictly positive periodic investments implies that the zero investments must be dropped in order to meet the strictly monotonous relationship between the proxy (investment) and output, a key condition of the approach. The resulting effect is the huge drop in the number of observations. The demerits of the method are rightly captured in the words of Levinsohn and Petrin (2003:321) that "firms that make only intermittent investments will have their zero-investment observations truncated from the estimation routine (i.e. the monotonicity condition does not hold for these observations). For manufacturing censuses, this can be a large portion of the data". A comparison of the variables used as proxy for productivity after cleaning the dataset is presented in Table 7.1. The details in Table 7.1 clearly shows a practical example of the real nature of reported or available manufacturing data with respect to investments and intermediate inputs and therefore presents a clear case of the advantage in using the LP over the OP method in this thesis.

Table 7.1: Comparison of Variables used as Proxy for Productivity Based on the Ghanaian Manufacturing Dataset.

Variable	**Cleaned Data**			
Input Variables	**Positive**	**Zero**	**Missing**	**Total**
Real Raw Materials Cost	1,173	-	-	1,173
Real Indirect Cost	1,173	-	-	1,173
Real Investment (P&E)	506	660	7	1,173
Real Investment (L&B)	53	258	862	1,173

Source: Author's construct from RPED, GMES dataset.

It can be seen from Table 7.1 that as many as 660 and 862 observations in the final dataset had zero or non-reported investments in plant and equipment; and land and building respectively. Therefore, in comparison to using intermediate inputs as proxy, about 56% and as high as 73% observations would have been excluded if investment in plant and equipment or investment in land and building respectively was used as proxy for unobserved productivity shock. Subsequently, materials with 100% of the observations serve as the primary proxy for productivity shock in this study. The LP estimator is carried out using the *levpet* command in STATA that was written by Petrin et al. (2004). An exposition of the LP method is presented in Appendix D.1 (see: Petrin et al., 2004; Levinsohn and Petrin, 2003 for further details). In view of the fact that an unbalanced panel is used, we implicitly take care of firm entry and exit, therefore dealing with selection bias. Consequently, the use of the LP does not make it a less efficient estimator.

In the second step, the effect of tariff and other trade variables as well as firm characteristics on the derived TFP were determined. Even though tariff rates are likely to be endogenous to productivity levels, it can nonetheless be reasonably assumed that such endogeneity may not exist in the current study since tariffs changes were uniform across subsectors (see Table 5.1 in Chapter 5). In addition, tariff reforms in Ghana were externally motivated as part of meeting conditionalities of IMF sponsored structural adjustments programmes. Moreover, the lobbying power of the Ghanaian private sector has been found to be weak as per the study of Asem et al. (2013). It is therefore assumed that the private sector had no power to influence the trend of tariffs over the period. Consequently, changes in tariffs could not have been in response to productivity growth in particular sectors. In other words, it can be concluded that policymakers were not selective in setting tariffs. Therefore, the effect of tariffs on productivity as analyzed in this thesis does not pertain to reverse causality.

For the robustness of results, the tariff-productivity analysis was carried out using two different estimation methods: fixed effects and system GMM. All the empirical estimations were done in STATA 15. The STATA built in command, *xtreg* was used for the fixed effects estimations. The use of the FE estimator solves any possible endogeneity issues relating to tariffs and productivity. The fixed effects estimation assumes that unobserved productivity is plant-specific but time-invariant. In other words, unobserved productivity is assumed to be constant over time. The benchmark model for the fixed effects estimation is as presented earlier in equation 7.5.

According to Ackerberg et al. (2007), the use of only the within-firm variation in the sample allows the fixed effect estimator to overcome the usual simultaneity bias. Also, the selection bias due to the endogenous exit of the sample is eliminated since the time-invariant firm specific effects determine the exit decisions and not (u_{it}^{q}) (Van Beveren, 2012).

Further test was carried out that confirmed the need to use the fixed effects method of panel data models in the analysis of the tariffs-TFP relationship. Specifically, a Hausman test was performed to choose between fixed and random effects model. The Hausman test is used to determine whether the errors are correlated with the regressors or not. The null hypothesis, H_0 was the errors are uncorrelated with the regressors. From the test results displayed in Table D.2 in Appendix D, the p-value of 0.0000 obtained was significant and therefore the null hypothesis was rejected. Hence, the fixed effects model is consistent and favoured. However, due to the presence of heteroscedasticity in the dataset, the Hausman test which assumes homoscedasticity of data cannot be said to present accurate results in this case. Therefore, a robust specification test that is robust to heteroscedasticity using *xtoverid* was also carried out and the results also favoured a fixed effects model. That is: a test of overidentifying restrictions: fixed vs random effects, was done for cross-section time-series model using the following STATA command: *xtreg re robust cluster (firm), xtoverid.* A p-value = 0.0000 was obtained and therefore, the tariffs-TFP analysis was carried out with the fixed effects and not with the random effects estimator. Consequently, the possibility of trade policy endogeneity in the data was taken care of since input endogeneity problems are completely addressed by the fixed effects estimator (Ackerberg et al., 2007). The fixed effects estimator is further preferred because it controls for any omitted time invariant variables bias unlike the random effects, which only reduces standard errors, but not bias.

The second estimator, the system GMM was obtained with *xtabond2*, written by Roodman (2009) and implements the system GMM estimation of Arellano-Bover/Blundell-Bond (Blundell and Bond, 1998; Arellano and Bover, 1995). The user-written command by Roodman (2009) is therefore similar to the *xtdpdsys* command of Arellano and Bover (1995) and uses instrumental variables of endogenous variable as lags in levels and differences. Additionally, *xtabond2* has the "ability to 'collapse' instruments to limit instrument proliferation" (Roodman, 2009:87) since overidentification is common in dynamic panels (Bun and Sarafidis, 2015), a

weakness of the system GMM[23] estimator. Further advantages of the *xtabond2* command are that it allows for more options in the use of instruments as well as allowing for the endogeneity of the dependent or independent variables to be worked separately (Labra and Torrecillas, 2018). Furthermore, the Roodman (2009) command is preferred in the current study because our dataset consists of short periods and larger observations (that is, small T, large N) and *xtabond2* is said to be the best choice when the panel has a short period of time since "it incorporates the instruments in levels, reducing the loses of information" (Labra and Torrecillas, 2018:44).

The system GMM was also used as a measure of firm-level TFP because it has an additional advantage of being able to control for the role of lagged firm productivity in order to avoid any possible serial correlation in the TFP estimation (Fernandes, 2007). Furthermore, it relaxes the time-invariant nature of the fixed effects model by decomposing productivity into a fixed effect and an autoregressive AR (1) component (Blundell and Bond, 2000). Moreover, it solves the simultaneity and selection biases associated with the OLS estimator (Van Beveren, 2012). Thus, for the system GMM, the tariff-productivity analysis was carried out with the following equation:

$$\begin{aligned}\ln TFP_{ijt} = {} & \alpha_0 + \alpha_1 \ln TFP_{ijt-1} + \alpha_2 lnT_{jt-1} + \alpha_3\left(lnT_{jt} \times imports\right) + \alpha_4(imports) \\ & + \alpha_5\left(lnT_{jt} \times lnIm\_share\right) + \alpha_6(lnEx\_share) + \alpha_7(lnIm\_share) \\ & + \alpha_8(exports) + \beta' X_{it} + \alpha_i + \alpha_t + \epsilon_{it} \qquad (7.7)\end{aligned}$$

Where $\ln TFP_{ijt-1}$ represent the first lag of firm TFP, $\ln T_{jt-1}$ refers to the first lag of tariffs and the definition of the other variables are the same as previously presented. Lagged productivity is controlled for because, the TFP determinants are believed to be highly persistent (Dovis and Milgram-Baleix, 2009). In addition, both static and dynamic effects have been analysed in order to capture the differences such effects have on productivity via trade policy. These differences, in the views of De Loecker and Goldberg (2014) can be important for researchers interested in separately identifying the impact of trade liberalization on the various components of performance as is the case of this thesis. In all the estimations, the two-step GMM estimates are obtained because it is said to be more efficient since it employs heteroscedastic weight matrix for the estimations (Labra and Torrecillas, 2018).

[23] The system GMM suffers from a high probability of overidentification due to higher levels of instruments (Labra and Torrecillas, 2018).

To further check the robustness of the results, other proxies for productivity shocks other than materials cost such as indirect real materials costs were also used in estimating the LP production function for more robustness of the results.

7.2 Empirical Model and Estimation of Profitability Effects of Trade

A regression analysis has been carried out to determine the effect of trade policy and other variables on firm profitability. The model for the regression analysis is estimated as:

$$ln\pi_{it} = \theta_0 + \theta_1 lnT_{jt} + \theta_c C_{it} + \mu_{it} \qquad (7.8)$$

Where $ln\pi_{it}$ is the log profit for firm *i* in time *t*, that is GPM, NPM or GPE, lnT_t is the tariff variable (log of average bilateral tariff), C_{it} represents a set of control variables, θ_0, θ_1 and θ_c are coefficients to be estimated and μ_{it} is the error term. The control variables used in this work relate to ownership type (foreign, Ghanaian or mixed private owners), which is a set of dummy variables indicating whether a firm is under 100% Ghanaian control, foreign control or mixed control (both Ghanaian and foreign), the log of firm size is measured by the number of employees, and the log of productivity is based on the gross output TFP estimation in equation 7.4. The dependent variables in equation 7.8 is given as natural log of the profits (Baggs and Brander, 2006) in order to take into consideration the skewness of profits. In fact, all the other variables are in log as well. Also, to prevent the loss of data and an estimation covering only firms with positive profits, the inverse hyperbolic sine transformation (see Appendix C) was employed to convert all negative and zero profits[24] to positive values.

For the robustness of results, profit is measured via two common profitability ratios: gross profit margin and net profit margin. We also estimate the gross profit per employee, which in the view of Bryan (2007) should be of interest to most companies these days. All three measures of profitability have been presented earlier in Chapter 6 (see section 6.1.2). These are recapitulated here with specific definitions of variables employed pertaining to the current study. Gross profit margin is calculated as the ratio of gross profit relative to revenue as shown in equation (6.5). Specifically, gross profit margin is given as:

$$\pi_{GM} = \frac{R_l - M_l - W}{R_l} = \left\{1 - \left(\frac{M_l}{R_l}\right) - \left(\frac{W}{R_l}\right)\right\} * 100 \qquad (7.9)$$

[24] See Table 8.10 in Chapter 8 for a breakdown of the number of observations by profit sign.

Where R_l = log of real output; M_l = log of real materials cost; W = log of real wages. The variables M_l and W are the variable costs. The numerator in equation (7.9) represents gross profit, π_G as shown below:

$$\pi_G = R_l - M_l - W \qquad (7.10)$$

R_l, M_l, and W are as earlier defined. The GPM calculated in equation (7.9) indicates the percentage of revenue that is available to a company for covering its operating and other expenditures (Robinson et al., 2009). A higher π_{GM} points to a "combination of higher product pricing and lower product costs" as noted by Robinson et al. (2009:292). In other words, a higher gross profit margin is an indication of a company's competitive advantage in product costs as well as its competitive advantage in product pricing due to superior branding, better quality or exclusive technology for instance (Robinson et al., 2009). Consequently, profit margins can vary among different firms due to differences in competitive strategies and product mix. On the contrary, a low GPM shows that a firm's revenue is insufficient, implying that its profit is either relatively low or it has a high operating cost[25] and or low revenue income[26].

The gross profit per employee (π_{GE}) is expressed as the ratio of a firm's profits to its size, measured as the number of employees of the firm and determined as:

$$\pi_{GE} = \frac{\pi_G}{NE} \qquad (7.11)$$

Where: π_G is calculated per equation (7.10), the variables R_l, M_l, and W are however expressed in monetary terms, that is, Ghana cedis. NE represent the number of employees. The gross profit per employee ratio measures the profits generated by each employee of a firm on average over a specific period of time, usually on an annual basis. In other words, it measures the efficiency with which a company uses its employees. Generally, a higher profit per employee is desirable because it is an indication that the firm is making optimum use of its employees which is good for its growth.

Finally, the net profit margin (π_{NM}) defined as the ratio of net income to revenue as depicted in equation (6.7) is obtained as:

[25] This could be due to reasons such as the inefficient utilization of a firm's current or fixed assets or purchasing inputs on terms that are not favourable.

[26] Probably due to inadequate demand, inferior quality of services or severe competition.

$$\pi_{NM} = \frac{R_l - M_l - I - W}{R_l} = \left\{1 - \left(\frac{M_l}{R_l}\right) - \left(\frac{I}{R_l}\right) - \left(\frac{W}{R_l}\right)\right\} * 100 \qquad (7.12)$$

Where: R_l, M_l and W are as previously defined, and I is log real indirect cost. Hence, NI, the net income is represented by equation (7.13) below and does not include corporate tax and interest expenses as such data is not available in our dataset. As a result, the net profit margin could be overestimated. Nonetheless to capture the trade cost of engaging in imports of raw materials, the tariff paid on materials import is included in equation (7.13) and given as tariffs multiplied by materials import. For firms that do not import any material inputs, the tariff paid is zero. This also allows for a comparison of the NPM between importing firms and their non-importing counterparts.

$$NI = R_l - M_l - I - W - T_p \qquad (7.13)$$

Where all other variables are as previously defined and T_p represent tariff paid on imported materials and calculated as:

$$T_p = real\ value\ of\ materials\ imported\ * tariff\ rate$$

The net profit margin is best for instance in determining which company is more profitable than the other since it includes all expenses incurred by the firm. Therefore, a high NPM shows that a firm is able to withstand adverse economic conditions as well as ensuring that owners have adequate returns for their investments. Ultimately signalling a sign of good management. On the other hand, a low NPM indicates danger as shareholders are unable to earn a satisfactory return on their investments.

To assess and or control for other key trade variables in line with trade literature, we estimate:

$$ln\pi_{it} = \theta_0 + \theta_1 lnT_{jt} + \theta_2 (imports)_{it} + \theta_3 \left(lnT_{jt} \times imports\right)_{it} + \theta_4 (exports)_{it} + \theta_5 (lnEx\_share) + \theta_6 \left(lnT_{jt} \times lnIm\_share\right) + \theta_7 lnTFP_{ijt} + \theta_c C_{it} + \mu_{it} \qquad (7.14)$$

Where imports is a dummy variable for importing vs. non-importing, exports is a dummy variable representing exporting vs. non-exporting, *lnEx_share* is the log export share, *lnIm_share* is the log import share and the other variables are as defined in equation (7.8). Equations (7.8) and (7.14) are analysed using fixed effects and the system GMM estimatorseq. The use of fixed effects controls for all time-invariant variables at the firm-level, therefore good for reducing omitted variable bias. The FE estimator also controls for any endogeneity

relating to tariffs and profitability. For robustness of the results, the system GMM has also been employed. Additionally, the System GMM estimations control for endogeneity by allowing for lag dependency in the profitability analysis as well as capturing the contributions of other firm characteristics that can explain firm profits.

8 RESULTS AND DISCUSSIONS

In this chapter, we present and discuss the results of the study as well as robustness checks. Where appropriate, the results obtained in this thesis are related to previous findings in the literature. The chapter concludes with a recapitulation of the research questions and the corresponding findings.

8.1 Production Function and Benchmark Results

The key productivity results obtained are presented in this section. In Table 8.1, the production function estimates based on equation 7.3 for all private firms and across the different sub-sectors of manufacturing using the Levinsohn-Petrin (2003) methodology are presented. Sector wise estimation of the production function was carried out on the assumption that factor elasticities across sectors may differ, hence the need to capture such sector effects.

The production function in Table 8.1 exhibits both an increasing and decreasing returns to scale as per the Wald test. The Wald test is a test of constant returns to scale. The result of the Wald test indicates that output does not increase by the same proportion as inputs for sectors exhibiting decreasing returns. On the other hand, for sectors showing increasing returns, output more than increases as a result of an increase in inputs. Labour, capital and materials elasticities are seen to be statistically significant in the furniture subsector at the 5% and 1% levels respectively for fully owned Ghanaian firms, whereas capital and material elasticities are statistically significant at the 1% and 5% level respectively for all firms in the Food and Beverages subsector. Capital elasticity is significant also in the garments and metal and machines subsectors for all firms at the 10% and 1% levels respectively. Labour elasticity is significant statistically only in the furniture subsector.

In Table 8.2, we report the baseline results as derived from equation 7.5. For the entire dataset, larger firms are about 28% relatively productive, compared to smaller firms at the 1% level of significance. This outcome supports the evidence by Francis and Honorati (2016) and Bausch and Krist (2007) that larger firms are more productive than their smaller counterparts. In the same way, firms that exited were about 29% less productive in comparison to firms that survived at a significance level of 5%. The tariff variable is negative and insignificant across the four models, signifying that tariff reductions are not accompanied by significant changes in firm productivity. Considering that the tariff variable is negative and significant for firms with any foreign ownership as shown in Table 8.3, there is probably no spillover effect from the foreign or partial foreign firms to the local firms.

Table 8.1: Levinsohn Petrin Production Function Estimates by Sub-Sector.

Dependent Variable: ln real gross output								
	All Firms				Fully Owned Ghanaian Firms			
Variables	**Food & Bev.**	**Gams**	**Furn**	**Metal & Mach.**	**Food & Bev.**	**Gams**	**Furn**	**Metal & Mach.**
ln labour	0.026	0.006	0.050*	0.043	0.009	0.005	0.049**	0.034
	(0.068)	(0.006)	(0.028)	(0.042)	(0.045)	(0.006)	(0.025)	(0.042)
ln capital	0.980***	0.390*	0.230	0.530***	0.630**	0.430*	0.740***	0.090
	(0.336)	(0.205)	(0.257)	(0.182)	(0.303)	(0.235)	(0.287)	(0.248)
ln material	0.760**	0.010	0.680***	0.010	0.010	0.010	0.770***	0.980***
	(0.340)	(0.271)	(0.194)	(0.338)	(0.280)	(0.311)	(0.270)	(0.342)
N	201	315	305	352	132	304	266	269
Firms	26	39	37	43	17	38	32	31
Wald Test	1.766	0.406	0.960	0.583	0.640	0.445	1.559	1.104

Notes: (1) Standard errors in parentheses (2) ln real materials cost is used as proxy for productivity shock (3) Wald test = test of constant returns to scale (ln labour + ln capital + ln materials =1) (4) Gams and Furn refer to garments and furniture respectively (5) N is the number of observations and firms refer to the number of firms (6) Significance at * 10%, ** 5%, and *** 1%.

Source: Author's calculations from RPED, GMES dataset.

Table 8.2: Tariffs and Firm-Level Productivity (All Firms) – Fixed Effects Estimation.

Dependent Variable: ln TFP				
	(1)	(2)	(3)	(4)
ln Tariff	-0.1285	-0.1119	-0.1177	-0.1016
	(0.1619)	(0.1576)	(0.1631)	(0.1587)
ln firm size		0.2828***		0.2806***
		(0.0736)		(0.0735)
exit			-0.3029**	-0.2939**
			(0.1273)	(0.1233)
constant	3.4744***	2.5756***	3.4335***	2.5430***
	(0.5142)	(0.4756)	(0.5171)	(0.4773)
year effect	Yes	Yes	Yes	Yes
Observations	1173	1173	1173	1173
No. of firms	145	145	145	145
R^2 (within)	0.0280	0.0600	0.0366	0.0682

Notes: (1) All estimations contain firm fixed effects and sector effects (2) ln real materials cost is used as proxy for the productivity shock in the estimation of ln TFP (3) Robust standard errors that are clustered at the firm level are in parentheses (4) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

In Table 8.3, the fixed effects estimations of the tariff-productivity nexus from equation 7.6 are displayed. Across the four model specifications for firms that are fully or partially foreign owned, the tariff variable is negative as expected and statistically significant. This means that for non-indigenous private firms, decreasing tariffs are accompanied by an improvement in productivity. For instance, model 1 as depicted in Table 8.3 shows that a 10-percentage point reduction in tariff is associated with a 5.7% improvement in productivity at the 1% significance level. Indeed, the outcome is in line with the assertion that foreign firms benefit most from trade liberalization and often operate in domestic markets in order to enjoy the benefits from tariff and trade concessions (Ferdows, 1997). On the other hand, the tariff variable is unexpectedly positive for fully owned Ghanaian firms, an indication that higher tariffs are positively related to firm productivity for such firms and vice versa. Nonetheless, the results for all the four models, models 5 – 8 that pertains to only fully owned Ghanaian private firms are not statistically significant. Hence, the study does not provide concrete and significant evidence to support the positive tariff-productivity relationship for local private firms. A similar conclusion was drawn by Razzaque et al. (2003) where no significant relationship was observed between nominal tariffs and productivity in Bangladesh.

Firm size is reported to be positive and statistically significant across all the specifications. For instance, with respect to fully owned Ghanaian firms, bigger firms are about 23% better than smaller firms in terms of productivity at the 1% level of significance. Likewise, larger foreign firms are observed to be about 30 – 32% largely productive in comparison to their smaller counterparts at the 5% significance level. The positive relationship between firm size and productivity therefore confirms that larger firms are better performing as postulated by Francis and Honorati (2016). In fact, the positive firm size variable appears to be stronger for indigenous firms at a significance level of 1%. Furthermore, the exit variable is negative as anticipated but not significant. Nevertheless, the outcome of the exit variable implies that firms that survived are generally more productive than firms that exited. For instance, the results of models 2 and 4 from Table 8.3 show that surviving firms are about 9% and 16% respectively more productive than exiting firms even though the evidence for such a conclusion is weak due to the insignificance of the values.

Table 8.3: Tariffs and Firm-Level Productivity – Fixed Effects Estimation.

Dependent Variable: ln TFP	Full/Partial Foreign Owned Firms				Fully Owned Ghanaian Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln Tariff	-0.5678***	-0.4771***	-0.4100**	-0.4344**	0.1645	0.1731	0.2486	0.2415
	(0.1843)	(0.1673)	(0.1818)	(0.1771)	(0.2014)	(0.1985)	(0.1968)	(0.2012)
ln firm size		0.3277**	0.3096**	0.3009**		0.2349***	0.2312***	0.2361***
		(0.1359)	(0.1391)	(0.1369)		(0.0814)	(0.0788)	(0.0789)
exit		-0.0970	-0.1123	-0.0996		-0.1694	-0.1622	-0.1708
		(0.1220)	(0.1220)	(0.1228)		(0.1473)	(0.1440)	(0.1452)
ln Ex_share			0.0166				0.0146	
			(0.0410)				(0.0319)	
ln Tariffs*Ims			-0.0322				-0.0355	
			(0.0436)				(0.0235)	
ln Im_share			0.1294				0.0759	
			(0.1424)				(0.0589)	
imports				0.4729				0.2432
				(0.6046)				(0.2333)
ln Tariffs*Imd				-0.1167				-0.1207
				(0.1950)				(0.0936)
exports				0.0936				-0.0475
				(0.1147)				(0.0851)
constant	0.8052	-0.7877	-1.0238	-0.9102	0.8774	0.1930	-0.0188	-0.0054
	(0.5670)	(0.6485)	(0.7315)	(0.7097)	(0.6662)	(0.6377)	(0.6190)	(0.6346)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	202	202	202	202	971	971	971	971
No. of firms	27	27	27	27	118	118	118	118
R^2 (within)	0.1276	0.1728	0.1907	0.1911	0.0498	0.0766	0.0823	0.0820

Notes: (1) All estimations contain firm fixed effects and sector effects (2) ln real materials cost is used as proxy for the productivity shock in the estimation of ln TFP (3) Robust standard errors that are clustered at the firm level are in parentheses (4) ln Tariffs*Imd is an interaction term between log tariffs and the import dummy variable and ln Tariffs*Ims is an interaction term between log tariffs and log import share (5) models 1 – 4 apply to full/partial ownership of firms by foreigners whilst models 5 – 8 relate to only fully owned Ghanaian firms (6) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

In Table 8.4, results on the relationship between tariffs and firm level productivity using the system GMM estimation as per equation 7.7 are presented. Tariffs, the key variable of interest in this work is negative and statistically significant in the first model only for the entire dataset. The significant model implies that declining tariff rates result in increases in firm productivity. Thus, lending support to both the fixed effects and System GMM findings in Tables 8.9 and 8.10 that decreasing tariff rates lead to improvements in firm productivity. Particularly, a 10-percentage point reduction in tariffs is seen to cause an improvement in firm productivity of about 13% at the 10% significance level as depicted in model 1. Similar results were obtained by Ackah et al. (2012a) who observed that a 10-percentage point decrease in tariffs resulted in about 4.9% increase in firm productivity at the 1% significance level. Nevertheless, the effect in the current study is weak especially that the results of the other three models are insignificant.

For fully owned Ghanaian firms, the tariff variable is positive across the four models and significant only for model 3 at the 10% level of significance. That is, for local firms, a reduction in tariffs is accompanied by a decline in productivity of around 7.4%. Nonetheless, the results are not strong enough to conclude that lower tariffs indeed do induce lower firm productivity in locally owned firms because of the statistical insignificance of the other model results. In terms of firm size and productivity, a positive but insignificant relationship is observed. The import dummy and import share variables of fully owned Ghanaian firms are observed to be negative, indicating that firms that import or have a higher share of imports are not better performing in terms of their productivity than non-importers. However, these conclusions are rather weak since the results obtained are not significant statistically.

The p-values of the Hansen test for the null hypothesis of the validity of the overidentifying restrictions reported at the bottom of Table 8.4 are greater than 0.1 in all specifications. Hence, across all the model specifications, we do not reject the null hypothesis. In addition, we present the p-values for the AR (1) and AR (2), which are the test for first and second order autocorrelation respectively. The p-values of the AR (1) are significant across all specifications, indicating a high first order autocorrelation as expected. Lastly, there is no evidence of a significant second order autocorrelation in all specifications as per the p-values of the AR (2) reported in Table 8.4. Therefore, we can conclude that the test statistics reported hint at a proper specification.

Table 8.4: Tariffs and Firm-Level Productivity - System GMM Estimation.

Dependent Variable: ln TFP

	All Firms				Fully Owned Ghanaian Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln TFP $_{t-1}$	0.8096***	0.9313***	0.8840***	0.9085***	0.9241***	0.9262***	0.9275***	0.9441***
	(0.0885)	(0.0577)	(0.0835)	(0.0847)	(0.0365)	(0.0381)	(0.0363)	(0.0320)
ln Tariff $_{t-1}$	-1.3725*	-0.5168	-0.9071	-0.7029	0.7453	0.7575	0.7411*	0.4970
	(0.8245)	(0.5802)	(0.7713)	(0.6477)	(0.4622)	(0.4605)	(0.4451)	(0.3922)
ln firm size		0.1251	0.1138	0.0356		0.0657	0.0660	0.0998
		(0.1882)	(0.1837)	(0.1854)		(0.1451)	(0.1411)	(0.1238)
exit		-0.0460	0.0529	-0.0220		-0.0061	0.0053	0.0079
		(0.2162)	(0.1784)	(0.1523)		(0.1356)	(0.1332)	(0.1289)
imports			0.0971				-0.1054	
			(0.1109)				(0.1094)	
ln Im_share				0.0914				-0.1454
				(0.1209)				(0.0898)
ln Tariffs*Ims				-0.0193				0.0441
				(0.0412)				(0.0313)
ln Ex_share				-0.0539				-0.0095
				(0.0538)				(0.0379)
constant	5.1559*	1.5018	2.9154	2.3787	-2.3021	-2.5512	-2.4568*	-1.8016
	(2.9024)	(2.3087)	(3.0434)	(2.7018)	(1.4143)	(1.5538)	(1.4913)	(1.3517)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	969	969	969	969	795	795	795	795
No. of Firms	145	145	145	145	118	118	118	118
Instruments	16	26	23	23	14	17	19	23
AB 1 (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AB 2 (p-value)	0.3317	0.6934	0.4911	0.5508	0.5210	0.5402	0.5454	0.5072
Hansen test (p-value)	0.3523	0.1494	0.2829	0.1023	0.6687	0.2169	0.3411	0.4633

Notes: (1) The instruments for specifications for all columns are: differenced equation, ln Tariff lagged 1 period, lnTFP lagged 1 period, imports, ln Im_share, ln Ex_share, ln Tariffs*Ims, ln firm size and exit, differenced year dummies; levels equation, first difference of first lag of Tariffs, first lag of TFP, imports, ln Im_share, ln Ex_share, ln Tariffs*Ims, ln firm size and exit (2) lag limits for model 1 and 3 are (1 2); model 2 (1 4) and (1 1) for models 4 to 8 (3) Robust standard errors in parentheses (4) ln real materials cost is used as proxy for the LP estimation of ln TFP (5) models 1 to 4 apply to the entire dataset whilst models 5 – 8 relate to only fully owned Ghanaian firms (6) The null hypothesis underlying the autocorrelation test is that there is no autocorrelation (7) AB 2 is a test for second order serial correlation (8) Significance at * 10%, ** 5%, and *** 1%.

Source: Author's calculations from RPED, GMES dataset.

In all the System-GMM estimations reported in this thesis, smaller lag limits have been employed because deeper lags are said to be weak instruments (Mehrhoff, 2009) and also because they reduce the sample size.

8.1.1 Tariff-Productivity Nexus Based on Firm Characteristics

Table 8.5 present results of the impact of tariffs on firm productivity based on ownership in line with equation 7.5. It can be seen from Table 8.5 that a 10-percentage point reduction in tariffs is significantly accompanied by a 4.8%. and 3.8% increase in productivity for firms with partial or full foreign ownership and mixed owned firms at the 1% and 5% level of significance respectively. On the contrary, the tariff variable for fully owned Ghanaian firms is positive and not statistically significant. This outcome runs counter to the argument that exposure to international trade leads to an increase in the efficiency of domestic producers that were previously or initially protected (De Loecker and Goldberg, 2014; Bernard et al., 2011; Aghion et al., 2005; Helpman and Krugman, 1985). Firm size is positive and significant for Ghanaian, mixed and full/partial foreign owned firms as found earlier in Table 8.2. This outcome confirms the results of other studies in the literature (Francis and Honorati, 2016; Bausch and Krist, 2007) that larger firms are more productive as compared to their smaller counterparts.

Table 8.5: Tariffs and Firm-Level Productivity Based on Firm Ownership.

Dependent Variable: ln TFP				
	Ghanaian	Foreign	Any foreign	Mixed
	(1)	(2)	(3)	(4)
ln Tariff	0.1731	-12.6362**	-0.4771***	-0.3826**
	(0.1985)	(2.4437)	(0.1673)	(0.1671)
ln firm size	0.2349***	-0.4012	0.3277**	0.2821*
	(0.0814)	(0.5358)	(0.1359)	(0.1404)
exit	-0.1694	-0.1403	-0.0970	-0.0283
	(0.1473)	(1.0738)	(0.1220)	(0.1477)
constant	0.1930	45.0683***	-0.7877	-1.8028**
	(0.6377)	(6.7400)	(0.6485)	(0.7396)
year effect	Yes	Yes	Yes	Yes
Observations	971	27	202	175
No. of firms	118	4	27	23
R^2 (within)	0.0766	0.4273	0.1728	0.2444

Notes: (1) ln real materials cost is used as proxy for the productivity shock in the estimation of ln TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) Ghanaian refers to firms fully owned by Ghanaians, foreign refers to a fully owned foreign firm, Any foreign represents the share of foreign investment in a firm or full/partial foreign firm and Mixed applies to firms with both foreign and Ghanaian owners (4) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

It appears therefore from Table 8.5 that tariff reductions are more beneficial to foreign firms or firms that have any foreign owner in comparison to domestic ones. This is probably because

foreign firms responded more positively to decreases in tariffs. Also, the differences in productivity support the assertion that foreign owned firms are more productive than their local counterparts as found by Amiti and Konings (2007). The outcome of the results therefore lends credence to the fact that firm ownership is a key factor that "measure access to better managerial skills and the importance of firm learning" (Söderbom and Teal, 2001:1).

Since the relationship between tariffs and productivity for Ghanaian firms is inconclusive as per the results of Tables 8.3, 8.4 and 8.5, the Ghanaian importing firms were isolated for further analysis in the spirit of equation 7.6. The Ghanaian importing firms were selected because importing firms are presumed to benefit the most from falling tariffs. Therefore, in Table 8.6, the tariff-TFP analysis for Ghanaian firms engaged in importing is reported. From Table 8.6, the tariff variable is seen to be negative as expected across all the five models presented but significant at the 10% in the last model, suggesting that Ghanaian firms that import raw materials gain from tariff reductions. For example, model 5 depicts that a 10-percentage point reduction in tariff induces about 7% improvement in the productivity of fully owned Ghanaian firms that import materials at the 10% level of significance as displayed in Table 8.6. The results are consistent with the evidence put out by Amiti and Konings (2007) who found a 12% improvement in productivity for Indonesian firms that import inputs as a result of a 10-percentage point reduction in tariffs. The outcome of the statistically significant model imply that trade liberalization has a positive impact on indigenous firms that import raw materials. Hence, the trade orientation of firms in terms of their importing status is a key determining factor of productivity especially with regards to changes in tariffs.

The statistical insignificance of the first four models however indicate that the results are not robust enough to conclude that tariff changes positively impact on the productivity of local firms which are into importing. This is also because, the level of effect is quite weak at the 10% significance level. Furthermore, the lag limits of the first four models are smaller and more robust as against the deeper lag limits of 8 for the last model that is significant. As a result, the study does not provide strong evidence that declining tariffs are associated with higher productivity for local firms that import. Hence, the results do not suggest a learning by importing effect for fully owned Ghanaian firms that import raw materials for their production.

Again, as reported earlier in Table 8.4, the test statistics presented in Table 8.6 hint at a proper specification because across all the specifications, the p-values obtained are as expected. That

is, significant p-values for first order autocorrelation and insignificant p-values for both the second order autocorrelation and Hansen test.

In view of the fact that it takes some time for firms to adequately respond to policies, the tariff variable was lagged 5 and 7 years to account for such a delay. Across the four models of the 5-year lag reported in Table E.1 in Appendix E, the tariff variable was insignificant whereas that of the 7-year lag are negative and statistically significant in models 3 and 4. As a result, it can be concluded that it takes as long as 7 years for local firms to probably reorganize in response to trade incentives in the Ghanaian manufacturing sector. For instance, as per model 4 in Table E.1, a 10-percentage point reduction in tariffs will result in a 9.2% improvement in firm productivity by the 7th year of the initial tariff changes at the 5% significance level. Nonetheless, the insignificance of the first two models renders such a conclusion as weak.

Table 8.6: Tariffs and Firm-Level Productivity of Ghanaian Importing Firms.

Dependent Variable: ln TFP (Ghanaian Firms)					
	(1)	(2)	(3)	(4)	(5)
ln TFP $_{t-1}$	1.0350***	1.0483***	1.0626***	1.0545***	1.0618***
	(0.0438)	(0.0489)	(0.0430)	(0.0442)	(0.0369)
ln Tariff $_{t-1}$	-0.4452	-0.5724	-0.7489	-0.6128	-0.6985*
	(0.4715)	(0.5845)	(0.5145)	(0.4870)	(0.4119)
ln firm size		0.1036	0.0732	0.0479	0.0391
		(0.2429)	(0.1379)	(0.1234)	(0.1127)
exit		0.0798	0.1107	0.1050	0.0930
		(0.1590)	(0.1246)	(0.1160)	(0.1101)
constant	1.4045	1.4541	2.1288	1.7829	2.0476*
	(1.4760)	(1.6831)	(1.4606)	(1.4444)	(1.1891)
year effect	Yes	Yes	Yes	Yes	Yes
Observations	322	322	322	322	322
No. of firms	82	82	82	82	82
Instruments	16	20	32	35	38
AB 1 (p-value)	0.0020	0.0019	0.0022	0.0024	0.0029
AB 2 (p-value)	0.1800	0.1795	0.1839	0.1759	0.1631
Hansen test (p-value)	0.3995	0.6305	0.5030	0.6097	0.6895

Notes: (1) The instruments for specifications for all columns are: differenced equation, ln Tariff and ln TFP lagged 1 period, ln firm size and exit, differenced year dummies; levels equation, first difference of the first lags of ln Tariff and ln TFP, ln firm size and exit (2) lag limits are (1 1) for model 5, 7 and 8; (1 2) for models 1 to 3 and (1 3) for models 4 and 6 (3) Robust standard errors in parentheses (4) ln real materials cost is used as proxy for the LP estimation of ln TFP (5) The null hypothesis underlying the autocorrelation test is that there is no autocorrelation (6) AB 2 is a test for second order serial correlation (7) Significance at * 10%, ** 5%, and *** 1%.
Source: Author's calculations from RPED, GMES dataset.

An analysis of the tariff-productivity nexus of Ghanaian firms based on firm size, measured by the number of employees in each firm is reported in Table 8.7. Firms are grouped into four categories: micro, small, medium, and large enterprises. Micro firms are defined in this thesis

as firms with less than six employees; small firms are firms with an employee size of 6 to 19; firms with 20 to 75 employees are termed as medium whilst large firms are defined as those with more than 75 employees[27].

Table 8.7: Tariffs and Firm-Level Productivity of Ghanaian Firms Based on Size.

Dependent Variable: lnTFP (Ghanaian Firms)				
	Micro	Small	Medium	Large
	(1)	(2)	(3)	(4)
ln Tariff	1.2057***	0.1551	0.2140	-0.1413
	(0.3665)	(0.3577)	(0.2522)	(0.6222)
exit	-0.1275	-0.3322*	-0.0907	0.3303
	(0.3703)	(0.1790)	(0.0953)	(0.6579)
constant	0.5311	0.6993	0.0512	-0.2487
	(1.2323)	(1.2091)	(0.8229)	(2.0381)
year effect	Yes	Yes	Yes	Yes
Observations	158	382	333	98
No. of firms	38	74	64	19
R^2 (within)	0.0899	0.1027	0.1023	0.1166

Notes: (1) ln real materials cost is used as proxy for the productivity shock in the estimation of ln TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) Ghanaian firms refer to firms fully owned by Ghanaians (4) Significance at * 10%, ** 5%, *** 1%.
Source: Author's calculations from RPED, GMES dataset.

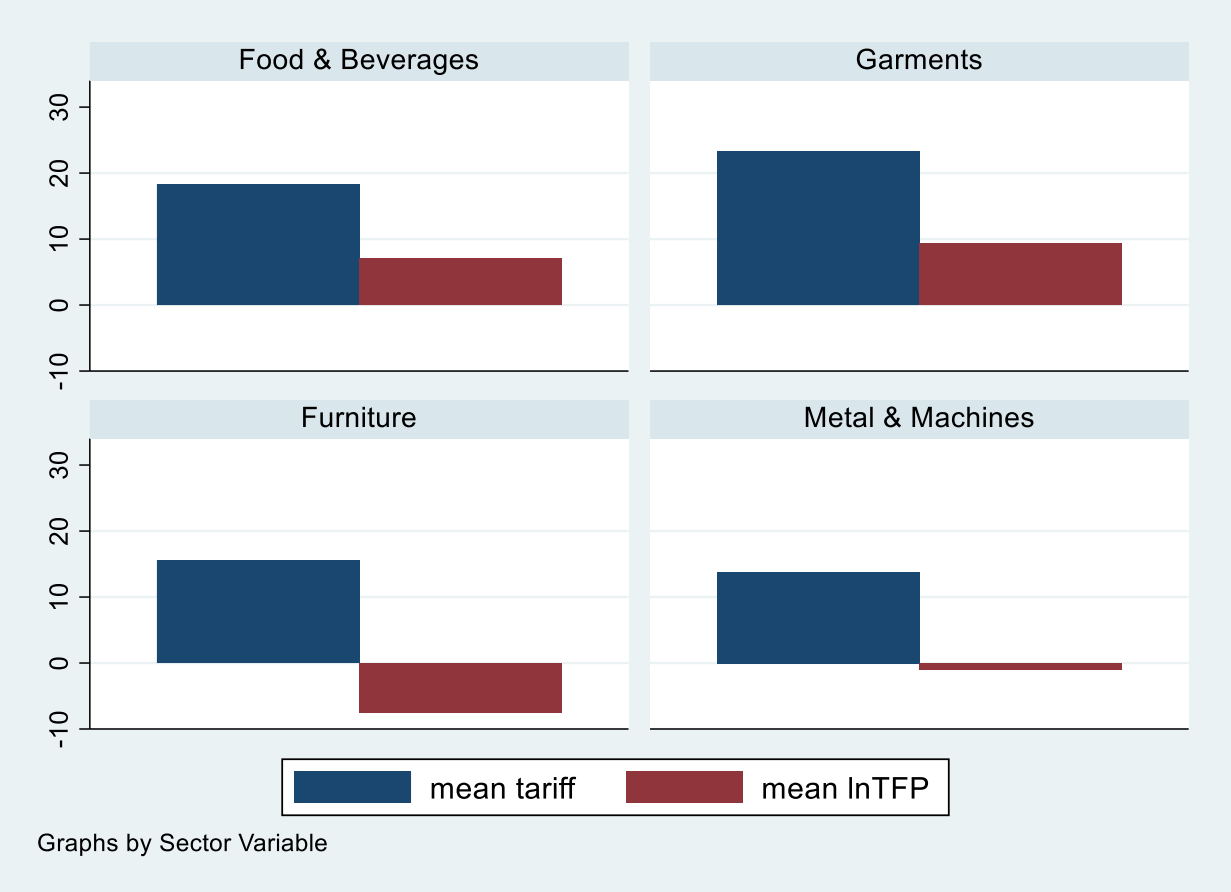
Tariff is found to be positively related to firm productivity for micro, small and medium enterprises (MSMEs) that are fully owned by Ghanaians, meaning that higher tariffs are associated with higher productivity whilst lower tariffs are associated with lower productivity. The results are however statistically significant only for micro firms as depicted in Table 8.7. For Ghanaian micro firms, a 10-percentage point decrease in tariffs is associated with 11.7% decline in firm productivity. The reverse is true at the 1% significance level, implying that Ghanaian micro firms are more productive with rising tariffs and less productive with declining tariffs. In other words, micro firms that are fully owned by Ghanaians are unable to perform well in terms of their productivity with increased competition due to trade. That is, lowering tariffs is accompanied by declining productivity for such firms. Subsequently, this outcome conforms to the infant industry argument that indigenous firms must be protected from foreign competition by way of imposing higher tariffs until they are able to grow, expand and can compete or withstand foreign competition. In fact, the positive relationship between tariffs and productivity outcome of private Ghanaian firms as depicted in Table 8.7 lends credence to the

[27] The definitions of the firm size are in line with Rankin et al. (2002), who compiled a report on the GMES.

assertion of Corden (1967) that a certain level of tariff is needed to establish the domestic industry.

In Figure 8.1, the relationship between average tariffs and average productivity by sub-sector of fully owned Ghanaian firms is reported. With regards to individual sub-sectors, it can be seen from Figure 8.1 that garments, and food and beverages subsectors are largely performing well in terms of their average total factor productivity over the study period considered. On the other hand, furniture, and metal and machines subsectors recorded negative average total factor productivity. In other words, in sectors where average tariffs have been lower, average productivity of local firms declined as shown by the negative average total factor productivity of the furniture, and metal and machines subsectors displayed in Figure 8.1. In contrast, for sectors where average tariffs over the period have been quite high, positive average productivity, indicating improvement in productivity have been recorded as depicted in the food and beverages and garments sub-sectors. This therefore suggest that Ghanaian firms are better off when tariffs are high and worse off when tariffs decline as revealed in earlier results.

Figure 8.1: Average Tariffs and TFP of Ghanaian Firms by Sub-Sector.



Source: Author's calculations from RPED, GMES dataset.

In terms of performance differences among firms with varying trade orientation, a general overview is presented in Table 8.8. The analysis was carried out without relating the productivity outcomes to changes in tariffs. The average productivity of local exporting firms is about 3% compared to 1% for their non-exporting counterparts as shown in Table 8.8. As a result, Ghanaian firms into exporting are observed to be largely more productive in comparison to non-exporters, supporting the learning by exporting hypothesis effect on productivity of local firms. This outcome falls in line with the results of (Yaşar, 2015; Mengistae and Pattillo, 2002; Bigsten et al., 1998) that exporters are more productive than non-exporters. Also, indigenous firms engaged in exporting are found to be performing better based on average productivity, about 3% relative to 0.9% for firms that import. Hence, confirming the assertion by the ECB (2017) that the most productive firms in an economy are those that export. Furthermore, the outcome lends support to an export-led strategy of development and helps to offer some insights into why developing countries that adopted export-led industrialization developed much faster than those that relied on an import substitution strategy.

On the other hand, in terms of importing, the same cannot be said because non-importing firms are observed to be performing better than importing firms in terms of average productivity. Table 8.8 reveals that the average productivity of local firms that do not import any raw material is about 2% whereas importing firms recorded a 0.9% improvement. This contrast with the findings of Foster-McGregor et al. (2016) who in their study of manufacturing firms in 19 Sub-Saharan African countries found that on the average, importers were more productive than non-importers. The present study does not provide any evidence for the learning by importing effect for local firms. A potential explanation could be due to the larger observations of firms not engaged in international trade in comparison to firms engaged in trade. Additionally, this could probably be as a result of the cost of engaging in international markets such as transportation cost and tariffs that non-importing firms do not incur.

Table 8.8: Average Total Factor Productivity of Fully Owned Ghanaian Firms Based on Trade Orientation.

Trade Status	Mean TFP	Std. Dev.	Min	Max	Observations	No. of Firms
Importers	.9103157	6.675.897	-1.026.449	1.179.797	378	93
Non-importers	1.991.977	7.048.551	-101.209	1.148.182	593	106
Exporters	3.052.042	5.914.645	-9.632.105	1.179.183	85	30
Non-exporters	1.428.802	6.998.057	-1.026.449	1.179.797	886	118

Source: Author's calculations from RPED, GMES dataset.

8.1.2 Alternative Measures of Productivity

For the robustness of the results, other alternative measures of productivity have been employed. In Table 8.9, the results of tariffs and firm level productivity using indirect materials cost as proxy for productivity shock are displayed. Across all specifications, the tariff variable is negative and significant as shown in Table 8.9, implying that lower tariffs are accompanied by increases in firm productivity with or without controlling for other trade and firm characteristics. For instance, a 10-percentage point reduction in tariffs is associated with a 4.36% and 4.27% for all firms and Ghanaian firms at the 5% and 10% significance level respectively (see models 1 and 5). Even with the control variables, the tariff variable is still negative and significant.

The results as presented in Table 8.9 corroborate the conclusions of Ackah et al. (2012a) that firms that are exposed to foreign competition do have higher productivity in comparison to firms that operate in highly protected industries. Their fixed effects model shows that a 10-percentage point reduction in tariffs leads to an increase in firm productivity of about 3.2% at the 10% significance level. The results of the tariff-productivity nexus therefore suggest that protectionism is detrimental to the growth of firms as argued by pro-trade proponents.

Furthermore, the export share variable in model 3 is positive but insignificant. Similar to the results reported in Tables 8.2 and 8.3, firm size is positive and significant across all specifications and a stronger effect at the 1% significance level among Ghanaian firms. For example, larger firms are about 19% and 26% largely productive in comparison to their smaller counterparts for the entire dataset and local firms at the 5% and 1% level of significance respectively. In the same way, the outcome of the exit variable is in line with results displayed in Table 8.2. even though the current effect is much weaker at a significance level of 10%. Models 2-4 in Table 8.9 reveal that firms that survived were about 26% relatively productive than firms that exited. For all other variables like in Table 8.2, no significant effect was found.

Table 8.9: Tariffs and Firm-Level Productivity using Indirect Materials Cost as Proxy: Fixed Effects Estimation.

Dependent Variable: ln TFP	All Firms				Fully Owned Ghanaian Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln Tariff	-0.4360**	-0.4152*	-0.4034*	-0.4486**	-0.4274*	-0.4106*	-0.4032*	-0.4363*
	(0.2169)	(0.2184)	(0.2115)	(0.2108)	(0.2293)	(0.2280)	(0.2266)	(0.2267)
ln firm size		0.1951**	0.1926**	0.1917**		0.2622***	0.2639***	0.2621***
		(0.0935)	(0.0941)	(0.0943)		(0.0990)	(0.0994)	(0.0996)
exit		-0.2636*	-0.2642*	-0.2584*		-0.3215	-0.3239	-0.3205
		(0.1523)	(0.1511)	(0.1513)		(0.2017)	(0.1994)	(0.2000)
ln Ex_share			0.0103				-0.0096	
			(0.0393)				(0.0426)	
ln Tariffs*Ims			-0.0042				-0.0027	
			(0.0317)				(0.0339)	
ln Im_share			0.0202				0.0107	
			(0.0898)				(0.0936)	
imports				-0.1157				-0.1152
				(0.3531)				(0.3677)
ln Tariffs*Imd				0.0512				0.0420
				(0.1258)				(0.1335)
exports				0.0720				0.0111
				(0.1241)				(0.1379)
constant	5.9239***	5.2684***	5.2299***	5.3718***	9.7545***	8.9654***	8.9363***	9.0454***
	(0.7017)	(0.7021)	(0.6742)	(0.6703)	(0.7487)	(0.7203)	(0.7052)	(0.7022)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1173	1173	1173	1173	971	971	971	971
No. of firms	145	145	145	145	118	118	118	118
R^2 (within)	0.0411	0.0560	0.0564	0.0569	0.0366	0.0625	0.0627	0.0627

Notes: (1) All estimations contain firm fixed effects and sector effects (2) ln real indirect materials cost is used as proxy for the productivity shock in the estimation of ln TFP (3) Robust standard errors that are clustered at the firm level are in parentheses (4) ln Tariffs*Imd is an interaction term between log tariffs and the import dummy variable and ln Tariffs*Ims is an interaction term between log tariffs and log import share (5) models 1 to 4 apply to the entire dataset whilst models 5 – 8 relate to only fully owned Ghanaian firms (6) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

In Table 8.10, the system GMM estimations of the Tariff-productivity regression analysis employing indirect materials cost as proxy for unobserved productivity is reported. The tariff variable is negative as found in previous results in Table 8.9 and significant in most of the models, signaling the positive effect of tariff reductions on firm productivity. For example, model 3 of Table 8.10 shows that a 10-percentage fall in tariff results in an improvement of firm productivity of about 13% at the 10% significance level for all firms. Likewise, for fully owned Ghanaian firms, a 10-percentage decrease in tariff leads to a 10.6% improvement in productivity at a significance level of 5% from model 6. Therefore, the results favour the argument that trade liberalization via lower tariffs results in higher firm productivity and should therefore be encouraged in closed economies. As a result, the results offer some rationale for the continuous call and support for trade openness by its proponents especially in the context of developing countries.

The tariff findings in Table 8.10 corroborate the fixed effects results presented in Table 8.9. Both findings however contradict the tariff-productivity results reported in Tables 8.2 and 8.3, where the tariff results for all firms and fully owned Ghanaian firms respectively were statistically insignificant. The tariff results are therefore not robust to different measures of firm productivity. Nevertheless, because tariffs directly affect raw materials import, and the results that employ raw materials as proxy for unobserved productivity are insignificant in the case of fully owned Ghanaian firms, it is not out of place to suggest that for such firms, declining tariffs are not backed by improvement in firm productivity. Consequently, the arguments for protecting local industries from stiff foreign competition by protectionist are in order. Here also, we reject the null hypothesis for the Hansen test based on the insignificance of the p-values across the model specifications. Likewise, the p-values of AR (1) and AR (2) are as expected. Therefore, the model specifications are in order.

Table 8.10: Tariffs and Firm-Level Productivity using Indirect Materials Cost as Proxy: System-GMM Estimation.

Dependent Variable: ln TFP

	All Firms				Fully Owned Ghanaian Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln TFP $_{t-1}$	0.8171***	0.8420***	0.9070***	0.9756***	0.8539***	0.9081***	0.9056***	0.9163***
	(0.0630)	(0.0601)	(0.0614)	(0.0395)	(0.0577)	(0.0397)	(0.0485)	(0.0445)
ln Tariff $_{t-1}$	-2.0305**	-2.0483**	-1.3169*	-0.4898	-1.6122**	-1.0641**	-1.2448**	-1.2080
	(0.8632)	(0.9284)	(0.7789)	(0.4653)	(0.6570)	(0.5136)	(0.6014)	(0.8307)
ln firm size		-0.1277	-0.0894	0.0393		0.0624	0.1143	0.0837
		(0.2448)	(0.2219)	(0.1477)		(0.1519)	(0.2575)	(0.2903)
exit		0.0227	0.0274	-0.0685		-0.0050	-0.0062	-0.0342
		(0.2981)	(0.2018)	(0.1137)		(0.2057)	(0.2200)	(0.2114)
imports			0.1161				-0.0396	
			(0.1348)				(0.1767)	
ln Im_share				-0.0163				-0.2452
				(0.1099)				(1.1961)
ln Tariffs*Ims				0.0118				0.0869
				(0.0408)				(0.4175)
ln Ex_share				0.0004				-0.0475
				(0.0445)				(0.0700)
constant	7.5577***	6.5937**	4.0956	1.1147	6.4910***	4.1202**	4.5358*	4.4483
	(2.9143)	(2.8857)	(2.7680)	(1.7961)	(2.4147)	(2.0179)	(2.5794)	(3.5503)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	969	969	969	969	795	795	795	795
No. of firms	145	145	145	145	118	118	118	118
Instruments	16	20	23	35	14	23	19	21
AB 1 (p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AB 2 (p-value)	0.2036	0.3200	0.5515	0.7680	0.1655	0.3253	0.2511	0.2761
Hansen test (p-value)	0.6142	0.4708	0.1410	0.1333	0.7723	0.7321	0.4782	0.3223

Notes: (1) The instruments for specifications for all columns are: differenced equation, ln Tariff and ln TFP lagged 1 period, imports, ln Im_share, ln Ex_share, ln Tariffs*Ims, differenced year dummies; levels equation, first difference of ln Tariff and ln TFP, imports, ln Im_share, ln Ex_share, ln Tariffs*Ims (2) Robust standard errors in parentheses (3) lag limits are (1 2) for models 1 to 3; (1 3) for models 4 and 6 and (1 1) for models 5, 7 and 8 (4) ln real indirect materials cost is used as proxy for the LP estimation of ln TFP (4) The null hypothesis underlying the autocorrelation test is that there is no autocorrelation (5) AB 2 is a test for second order serial correlation (6) Significance at * 10%, ** 5%, and *** 1%.

Source: Author's calculations from RPED, GMES dataset.

8.2 Profitability Effects of Trade

8.2.1 Benchmark Results

As presented earlier in sections 6.2 and 7.2, profitability was measured using three ratios: Gross Profit Margin (GPM), Gross Profit per Employee (GPE) and Net Profit Margin (NPM). In Table 8.11, we present a breakdown of the observations with positive, negative or zero profits in the three profit categories. A positive value for each ratio indicates a gain in profit, zero means that the firm breaks-even whilst a negative sign implies a loss in profit. The majority of firms, comprising 96.3% of firms are observed to be profitable based on the GPM and GPE ratios. Similarly, about 91.5% of firms are seen to be profitable whereas 0.2% of firms break-even as per the NPM ratio. On the other hand, as small as 3.7% and 8.4 % of firms recorded deficits as per the GPM/GPE and NPM ratios respectively. The GPM, GPE and NPM are derived from equations 7.10, 7.12 and 7.13 respectively. The general picture as reported in Table 8.11 reveals that about 90% of firms in the dataset recorded positive profits irrespective of the measure of profitability employed.

Table 8.11: Breakdown of Number of Observations by Profit Sign.

Measurement	**Frequencies**				**Percentages**		
	Positive	Negative	Zero	Total	Positive	Negative	Zero
GP Per Employee	1130	43	-	1173	96.3%	3.7%	-
Gross Profit Margin	1130	43	-	1173	96.3%	3.7%	-
Net Profit Margin	1073	98	2	1173	91.5%	8.4%	0.2%

Note: GP means gross profit.

Source: Author's calculations from RPED, GMES dataset.

Table 8.12 shows the gross output, the value of real materials imported, and the annual gross profits accrued for all firms over the 1991 to 2001 period. Generally, an increasing trend is witnessed as per the gross output and gross profit of firms between 1991 and 1999, after which a decrease is observed in the year 2000. Nevertheless, an increase is seen again in 2001. Ghana was rocked by a power crisis between 1998 and 2000, a situation that resulted in electricity power rationing in the country and therefore inadequate supply of energy to the manufacturing sector. This power crisis could be the main contributing factor for the fluctuating trend between 1999 and 2001, especially the lower values in 2000, a period when the crisis could have possibly reached its peak. In addition, the rate of inflation which went up strongly to about 40.5% in 2000 from 13.8% in 1999 according to the OECD/AfDB (2002) could be a contributory factor to the sharp decline in gross output in the year 2000.

In terms of real materials import, even though the lowest was observed in 1992, there was a steep decline in 2000. The sharp decline in both the gross output and materials import can be attributed in part to the foreign currency shortage in 2000. This was due to the severe drop in Ghana's foreign exchange earnings as a result of a reduction in external aid inflows and the rapid increase in crude oil prices (main import commodity) coupled with a fall in gold and cocoa prices (main export earners) in that year (OECD/AfDB, 2002). In fact, the cedi depreciated by 57% in nominal terms in 2000 against the US dollar. Also, the increase in VAT in June and a 20% special tax on non-essential imported items (OECD/AfDB, 2002), together with the depreciation of the cedi could have accounted for the decreases in imports in the year 2000. Furthermore, the high lending rates of commercial banks (about 30%) in 2000, a major source of income for firms coupled with the declining imports and output could explain the heavy decline in gross profits in that year. Indeed, for the first time in about a decade, Ghana suffered its worst economic growth in 2000 with real GDP growth plummeting to about 3.7%. Hence, there was a general decline in manufacturing output in Ghana during that period. In fact, the poor performance of the manufacturing sector in 2000 is said to have largely contributed to the unimpressive growth witnessed in the industrial sector since manufacturing accounts for 50% of industry output (OECD/AfDB, 2002).

Table 8.12: Gross Output, Real Materials Import and Gross Profit, 1991 – 2002.

Year	Gross Output	Real Materials Import	Gross Profit
1991	11,400	3,130	4,850
1992	14,200	2,400	5,920
1993	18,800	4,150	8,080
1994	21,200	4,840	9,030
1995	23,600	5,530	10,700
1996	31,600	7,700	16,000
1997	33,100	8,090	16,900
1998	33,000	6,900	17,600
1999	34,200	7,400	18,200
2000	15,500	3,370	8,070
2001	18,000	3,810	9,610

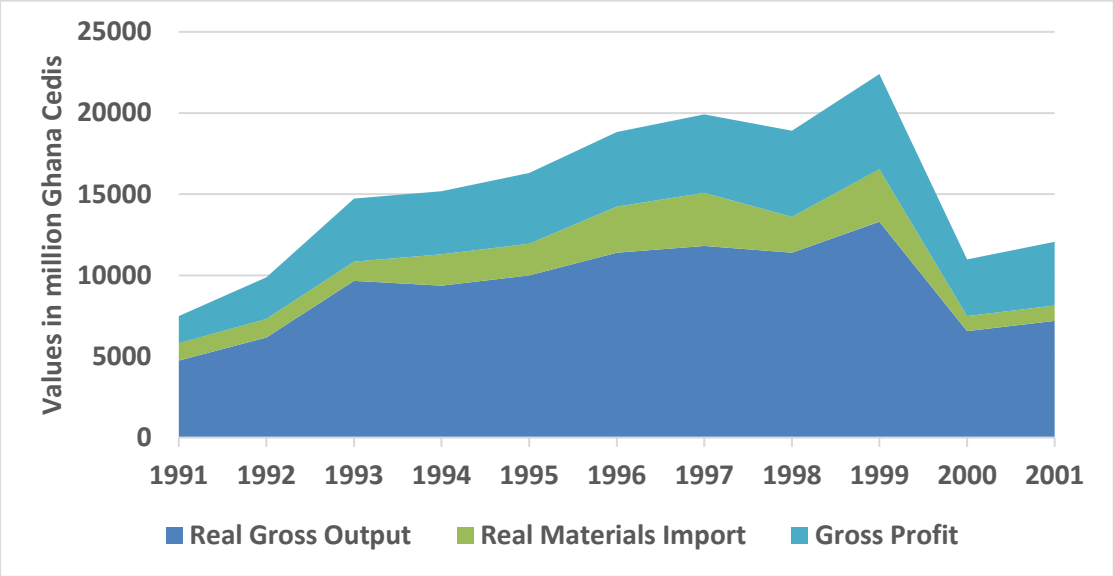
Notes: 1) values are in million Ghana cedis.
Source: Author's calculations from RPED, GMES dataset.

In general, as seen in Table 8.12, a positive trend is witnessed between real material imports and gross output. In other words, the more materials imported, the higher the gross output. Additionally, gross profit is observed to be on a higher side, when gross output increases. As a result, increasing imports is associated with higher output, which is then accompanied by

increases in gross profit. Subsequently, more imported intermediate inputs due to decreases in tariffs is seen to induce an increase in output and such efficiency then influences firm profits positively. This implies that decreasing tariffs is beneficial to firms in terms of their productivity and profitability as put forth in the Melitz model discussed in chapter 4 and the advocates of free trade.

In Figure 8.2, we concentrate on fully owned Ghanaian firms to determine if the pattern as observed in Table 8.12 reflects in such firms as well. The outcome as reported in Figure 8.2 indeed follows similar results observed in Table 8.12. That is, gross output is higher when more inputs are imported and the higher the gross output, the higher the gross profit. Consequently, it can be said that for firms that are locally owned, increasing the share of imports is likely to be associated with increase in gross output. Likewise, rising gross output is accompanied by higher gross profits, implying that higher tariffs are detrimental to firm growth and profitability, and the opposite is true. Such a relation can be attributed to the learning by importing hypothesis, which argues that importing firms learn via the technology embodied in imported raw materials which can result in higher productivity and profitability.

Figure 8.2: Gross Output, Real Materials Import and Gross Profit of Fully Owned Ghanaian Firms, 1991 – 2001.



Source: Author's calculations from RPED, GMES dataset.

Due to the impact of other variables on firm profitability such as firm characteristics, regression analysis was explored in order to take such variables into consideration. These results are reported in Tables 8.13 – 8.23. In Table 8.13, which presents the results of equation 7.8, the tariff variable is negative across all specifications and significant in the NPM models. This

means that tariff reductions are associated with increases in the net profit margin of firms. For example, models 5 and 6 show that a 10-percentage point reduction in tariffs is associated with 11.5% increase in the net profit margin of firms as depicted in Table 8.13. Also, in line with Stierwald (2010) that productivity enhances firm profitability, the results in Table 8.13 suggests that firm productivity is positively and significantly related to firm profitability, signaling that productivity is a key determinant of firm profitability. In other words, more productive firms tend to be more profitable.

Table 8.13: Tariffs and Firm-Level Profitability – Baseline Results (All Firms).

Dependent Variable:	ln GPM		ln GPE		ln NPM	
	(1)	(2)	(3)	(4)	(5)	(6)
ln Tariff	-0.4791	-0.4952	-0.8368	-0.9294	-1.1509**	-1.1526**
	(0.3556)	(0.3573)	(1.0349)	(1.0449)	(0.5602)	(0.5614)
ln TFP	0.1999*	0.2291**	1.4073***	1.5930***	0.5636***	0.5773***
	(0.1097)	(0.1139)	(0.3120)	(0.3203)	(0.1505)	(0.1482)
ln firm size		-0.1872		-1.3083***		-0.1587
		(0.1147)		(0.3323)		(0.1764)
exit		0.2485		1.1214**		-0.1615
		(0.1781)		(0.4864)		(0.3947)
constant	4.8045***	5.3314***	10.7866***	14.4503***	5.1342***	5.5691***
	(1.2929)	(1.2891)	(3.7432)	(3.7177)	(1.8702)	(1.9460)
year effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1173	1173	1173	1173	1173	1173
No. of firms	145	145	145	145	145	145
R^2 (within)	0.0251	0.0290	0.0547	0.0698	0.0493	0.0506

Notes: (1) Fixed effects estimations with firm fixed effects, year effects and sector effects via TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) models 1-2 are the GPM estimates, models 3-4 apply to GPE and models 5-6 are the NPM estimates (4) lnTFP is the total factor productivity (5) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

Interestingly however, firm size is reported to be negative and significant at the 1% level in model 4 as reported in Table 8.13, denoting that smaller firms are more profitable than larger firms when profit is measured as the gross profit per employee. This outcome digresses from theory and the results of most of the literature (Gaio and Henriques, 2018; Doğan, 2013; Majumdar, 1997). Nevertheless, it can be attributed to the numbers of employees in small firms, who are mostly not paid employees. For instance, manufacturing data from the 2003 national industrial census in Ghana revealed that micro and small firms had about 89.4% of unpaid employees as reported in Table 2.5. Indeed, small firms in developing countries are

mostly family ran businesses[28] that are often characterized by non-wage labour, mostly family members, who often do not draw regular wages (Abor and Quartey, 2010) in comparison to larger firms, who hire highly skilled labour and therefore have higher labour costs in their financial books.

In line with trade literature, Table 8.14 reports the results of equation 7.14. The tariff variable is negative in all models and significant at the 10% level in only model 6. Similar to the results of Table 8.13, the results in Table 8.14 also suggests that firm productivity is positively related to firm profitability. Such an effect is even stronger for fully owned Ghanaian firms since the productivity variable is positive and statistically significant at the 1% level as against the 5% and 10% significance level for all firms. In the case of the import dummy variable, it is positive and significant at the 10% level for the entire dataset as shown in model 3, indicating that importing firms are more profitable in comparison to non-importing ones. Likewise, the import share variable is positive and significant at the 5% level for all firms, denoting that the share of a firm's import is an important determinant of its profitability. On the contrary, the import dummy and import share variables though positive are not significant in the case of fully owned Ghanaian firms. Nonetheless, the interaction of tariffs and import share is negative and significant at the 10% level, indicating that the scale of imports rather than the import status of firms is a driver of a firm's profitability for fully owned Ghanaian firms.

In terms of the export status of firms and GPM, a positive and significant relationship is observed in both the entire dataset and fully owned Ghanaian firms as depicted in models 3 and 7. For instance, from model 7, exporting private firms that are solely owned by Ghanaians are around 34% largely better off in profitability than non-exporters at the 10% level of significance. Likewise, for the entire dataset, exporting firms are about 32% more profitable relative to non-exporters. Furthermore, firm size is negative and significant in 5 models at the 10% level as reported earlier in Table 8.13, suggesting that smaller firms are better off in terms of profitability than larger firms based on the GPM measure. This outcome does not conform to evidence by Gschwandtner and Hirsch (2016) and Schiefer et al. (2013) that firm size has a positive and significant impact on profitability as found in their study of the food processing industry of both the United States of America and the European Union.

[28] Especially that the current dataset contains about 46% of firms being organized as sole proprietorship (see Table 5.2) and about 47% of manufacturing firms as per the 2003 national industrial census are sole proprietorships (see Table 2.3).

Table 8.14: Tariffs and Firm-Level Profitability (Gross Profit Margin).

Dependent Variable: ln GPM	All Firms				Fully Owned Ghanaian Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln Tariff	-0.5048	-0.4952	-0.2841	-0.2567	-0.6018	-0.7191*	-0.5163	-0.4877
	(0.3595)	(0.3573)	(0.3920)	(0.3864)	(0.4688)	(0.4211)	(0.4511)	(0.4463)
ln TFP		0.2291**	0.2209*	0.2177*		0.6046***	0.5964***	0.5892***
		(0.1139)	(0.1129)	(0.1124)		(0.1821)	(0.1788)	(0.1775)
ln firm size		-0.1872	-0.2097*	-0.2103*		-0.2350*	-0.2606*	-0.2580*
		(0.1147)	(0.1152)	(0.1166)		(0.1333)	(0.1350)	(0.1370)
exit		0.2485				0.3384		
		(0.1781)				(0.2263)		
imports			1.1037*				0.9479	
			(0.5754)				(0.6318)	
ln Tariffs*Imd			-0.3931*				-0.3481	
			(0.2060)				(0.2328)	
exports			0.3174**				0.3422*	
			(0.1487)				(0.1867)	
ln Im_share				0.2742**				0.2445
				(0.1302)				(0.1487)
ln Tariffs*Ims				-0.1020**				-0.0938*
				(0.0465)				(0.0542)
ln Ex_share				0.1067				0.1010
				(0.0666)				(0.0741)
constant	5.4991***	5.3314***	4.7713***	4.7048***	5.7574***	5.9434***	5.3894***	5.3062***
	(1.1627)	(1.2891)	(1.3862)	(1.3670)	(1.5251)	(1.4199)	(1.5049)	(1.4922)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1173	1173	1173	1173	971	971	971	971
No. of firms	145	145	145	145	118	118.0000	118.0000	118.0000
R^2 (within)	0.0174	0.0290	0.0339	0.0344	0.0245	0.0866	0.0900	0.0901

Notes: (1) Fixed effects estimations with firm fixed effects, year effects and sector effects in models with TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) models 1-4 apply to the entire dataset whilst models 5 – 8 relate to fully owned Ghanaian firms (4) lnTFP is the total factor productivity (gross output), in the case of fully owned Ghanaian firms, the TFP employed was calculated separately for Ghanaian firms (5) ln Tariffs*Imd is log tariffs-import dummy interaction and ln Tariffs*Ims is log tariffs-log import share interaction (6) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

The fixed effects results of the tariff – profitability nexus using net profit margin as a measure of profitability are presented in Table 8.15 in line with equation 7.14. For all firms, the tariff variable is negative and significant in all but two models, denoting that tariff reductions are beneficial to firms with respect to their net profit margin. For example, models 1 and 2 as reported in Table 8.15 show that a 10-percentage point tariff reduction is associated with a 12% and 11.5% increase in firm profits at the 5% significance level respectively. Similarly, in all specifications of fully owned Ghanaian firms, the tariff variable is negative and significant statistically at the 5% level or higher. Hence, suggesting that for such firms, falling tariffs are associated with an improvement in firm profits in terms of net profit margin. For instance, models 5 and 7 depict that a 10-percentage point reduction in tariffs is associated with about 14% and 13% increase in profitability respectively for private indigenous firms. Therefore, firms owned by Ghanaians are seen to enjoy high profitability as a result of declining tariffs. This finding runs counter to the argument by Gashgari (2016) that trade liberalization renders locally owned enterprises less profitable, and eventually lead to their exit from the market. Consequently, the results offer support for reducing barriers to trade in the form of lowering tariffs. As expected, a positive relationship between firm productivity and profitability is reported. The high significance of the productivity variable (i.e. TFP) at the 1% level suggests that more productive firms earn higher profits.

In terms of the trade orientation of firms and profitability, the findings reveal a positive effect. For example, firms that export are observed to be about 73% largely profitable in relation to non-exporters for the entire dataset and 60% with regards to locally owned firms at the 1% significance level. Additionally, the export share variable is positive and significant as well. Subsequently, there is strong evidence to suggest that exporting firms are more profitable. In a similar way, the import status dummy of local private firms is positive and significant at the 5% and 10% for all firms and indigenous firms respectively. Hence, importers can be said to be more profitable relative to non-importers. Also, the import share variable is positive and significant, suggesting that the share of imports is a major factor in the profits of importing firms. Indeed, an even greater effect at the 5% and 1% levels of significance is reported for the interaction variables of tariff and import, and tariffs and import share respectively. This indicates that the higher the share of imports, the larger the gain in profitability. Subsequently confirming the interaction results presented in Table 8.14. Similar to the GPM results, the firm size variable is negative but not significant as shown in Table 8.15.

Table 8.15: Tariffs and Firm-Level Profitability (Net Profit Margin).

Dependent Variable: ln NPM

	All Firms				Fully Owned Ghanaian Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln Tariff	-1.2233**	-1.1526**	-0.7749	-0.6603	-1.4746**	-1.6454***	-1.3287**	-1.2269**
	(0.5788)	(0.5614)	(0.5935)	(0.5897)	(0.6753)	(0.6000)	(0.6229)	(0.6183)
ln TFP		0.5773***	0.5796***	0.5724***		1.0284***	1.0161***	1.0006***
		(0.1482)	(0.1473)	(0.1450)		(0.2121)	(0.2085)	(0.2056)
ln firm size		-0.1587	-0.2073	-0.2056		-0.1806	-0.2213	-0.2113
		(0.1764)	(0.1744)	(0.1756)		(0.1914)	(0.1923)	(0.1950)
exit		-0.1615				0.0410		
		(0.3947)				(0.3833)		
imports			2.0109**				1.5379*	
			(0.8026)				(0.8507)	
ln Tariffs*Imd			-0.7838**				-0.6142*	
			(0.3011)				(0.3292)	
exports			0.7385***				0.6071***	
			(0.2033)				(0.2193)	
ln Im_share				0.5500***				0.4474**
				(0.1965)				(0.2174)
ln Tariffs*Ims				-0.2271***				-0.1879**
				(0.0744)				(0.0841)
ln Ex_share				0.2262**				0.1573*
				(0.0877)				(0.0836)
constant	7.0922***	5.5691***	4.6098**	4.2986**	7.9741***	7.5810***	6.7509***	6.4374***
	(1.8749)	(1.9460)	(2.0140)	(2.0046)	(2.2135)	(1.9884)	(2.0448)	(2.0385)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1173	1173	1173	1173	971	971	971	971
No. of firms	145	145	145	145	118	118	118	118
R^2 (within)	0.0173	0.0506	0.0663	0.0707	0.0258	0.1251	0.1351	0.1377

Notes: (1) Fixed effects estimations with firm fixed effects, year effects and sector effects in models with TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) models 1-4 apply to the entire dataset whilst models 5 – 8 relate to fully owned Ghanaian firms (4) lnTFP is the total factor productivity (gross output), in the case of fully owned Ghanaian firms, the TFP employed was calculated separately for Ghanaian firms (5) ln Tariffs*Imd is log tariffs-import dummy interaction and ln Tariffs*Ims is log tariffs-log import share interaction (6) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

In Table 8.16, the tariffs and firm-level profitability using gross profit per employee as a measure of profitability is presented based on equation 7.14. The tariff results are similar to that reported on the GPM in Table 8.14. Particularly, firm size is negative and significant at the 1% level, a result that has also been previously obtained for European manufacturing and services firms by Goddard et al. (2005). In contrast to the NPM results in Table 8.15, the tariff variable, though negative, is insignificant across all the model specifications. As a result, we cannot conclude that tariff changes affect profitability in a positive way when measured by the gross profit per employee. Similarly, there is no evidence to support the argument that importers perform better than non-importers with respect to the gross profit per employee of local firms because both the import dummy and import share variables are positive but not significant as shown in models 7 and 8 of Table 8.16. This finding does not reveal whether indigenous firms' participation in international trade via imports has any influence on its profitability in terms of the gross profit per employee. Indeed, this outcome corroborates the results of Wagner (2011), whose evidence from German manufacturing enterprises showed that the import status of firms has no impact on their profitability from using profit margin as a measure of profitability. However, the statistical significance of the import share and tariff-import share variables for all firms suggest that firms with a high share of imports benefit from tariff reductions.

In terms of productivity and profitability, a positive relationship is observed as reported earlier from the GPM and NPM estimators, showing that firm productivity positively influences its profitability. In line with previous results of the GPM and NPM measure of profitability, the export variable is positive and significant at the 5% level for both the entire dataset and fully owned Ghanaian firms. Also, the export share variable is positive and significant. For example, for firms with a high share of exports, their gross profit per employee is around 35.7% at the 10% significance level in comparison to firms with less exports as displayed in model 4 of Table 8.16. The outcome of the export variable has been consistent even with different measures of profitability. Consequently, it can be concluded that the export activities of firms greatly influence their profitability. In other words, exporting firms are more likely to be profitable relative to non-exporting firms.

Table 8.16: Tariffs and Firm-Level Profitability (Gross Profit per Employee).

Dependent Variable: ln GPE	All Firms				Fully Owned Ghanaian Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln Tariff	-1.0176	-0.9294	-0.4017	-0.2655	-1.1150	-1.5698	-1.0601	-0.9066
	(1.0880)	(1.0449)	(1.1254)	(1.1120)	(1.4387)	(1.3026)	(1.3501)	(1.3446)
ln TFP		1.5930***	1.5593***	1.5491***		2.4470***	2.4259***	2.3984***
		(0.3203)	(0.3181)	(0.3166)		(0.5005)	(0.4888)	(0.4845)
ln firm size		-1.3083***	-1.3810***	-1.3824***		-1.3775***	-1.4741***	-1.4611***
		(0.3323)	(0.3321)	(0.3374)		(0.3850)	(0.3879)	(0.3953)
exit		1.1214**				1.0254		
		(0.4864)				(0.6309)		
imports			2.8045				2.4966	
			(1.7411)				(1.9311)	
ln Tariffs*Imd			-0.9915				-0.9172	
			(0.6078)				(0.6881)	
exports			1.0864**				1.3722**	
			(0.4175)				(0.5611)	
ln Im_share				0.7404*				0.6922
				(0.3998)				(0.4665)
ln Tariffs*Ims				-0.2795**				-0.2690
				(0.1400)				(0.1654)
ln Ex_share				0.3579**				0.3823*
				(0.1739)				(0.2014)
constant	15.6762***	14.4503***	13.1177***	12.7671***	15.6522***	17.5242***	16.2138***	15.7536***
	(3.5317)	(3.7177)	(3.9653)	(3.9141)	(4.7046)	(4.2818)	(4.4488)	(4.4376)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1173	1173	1173	1173	971	971	971	971
No. of firms	145	145	145	145	118	118	118	118
R^2 (within)	0.0176	0.0698	0.0728	0.0734	0.0221	0.1227	0.1271	0.1268

Notes: (1) Fixed effects estimations with firm fixed effects, year effects and sector effects in models with TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) models 1-4 apply to the entire dataset whilst models 5 – 8 relate to fully owned Ghanaian firms (4) lnTFP is the total factor productivity (gross output), in the case of fully owned Ghanaian firms, the TFP employed was calculated separately for Ghanaian firms (5) ln Tariffs*Imd is log tariffs-import dummy interaction and ln Tariffs*Ims is log tariffs-log import share interaction (6) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

8.2.2 Firm Characteristics and Profitability

In Table 8.17, the gross output and gross profits of importing and non-importing firms are compared. Comparatively, importers have higher gross outputs and gross profits relative to non-importers. The outcome reveals that the more the imports, the higher the gross output and the higher the gross profits. Subsequently, for non-importers, gross output and the corresponding gross profits are on a lower side. This could be explained by the assertion that importing firms learn via foreign technology embodied in what they import (Hasan, 2002) which their non-importing rivals are unable to directly access. In addition, importing firms outperforming non-importers can be attributed to the high competitiveness of firms that are exposed to international markets as a result of reducing protection for domestic firms.

Table 8.17: A Comparison of Output and Gross Profit between Importers and Non-Importers (million Ghana cedis).

	Importers			**Non-importers**	
Year	Gross Output	Real Materials Imports	Gross Profit	Gross profit	Gross Output
1991	10,200	3,130	4,390	458	1,290
1992	8,290	2,400	3,130	2,790	5,950
1993	14,700	4,150	6,660	1,420	4,050
1994	15,600	4,840	6,700	2,320	5,640
1995	17,200	5,530	8,130	2,550	6,340
1996	25,100	7,700	13,700	2,310	6,410
1997	27,100	8,090	14,600	2,280	5,990
1998	28,300	6,900	15,500	2,190	4,680
1999	30,100	7,400	16,500	1,730	4,070
2000	12,100	3,370	6,250	1,820	3,450
2001	14,700	3,810	7,830	1,780	3,290

Source: Author's calculations from RPED, GMES dataset.

Sector wise, the story is similar to that reported in Table 8.17. In Table 8.18, the gross output, Real Material Imports (RMI) and gross profit are presented by subsector. It can be seen from Table 8.18 that sectors in which material imports are high, also witnessed higher gross outputs and profits over the period considered for the entire dataset as well as for fully owned Ghanaian firms. As displayed in Table 8.18, Food and Beverages subsector highly engages in international market by way of real material import, followed by metal and machines subsectors. On the other hand, garments and furniture subsectors are less engaged in imports over the period.

Table 8.18: Gross Output, RMI and Gross Profit by Sub-Sector (million Ghana cedis).

	All Firms			Fully Owned Ghanaian Firms		
Sector	**Gross Output**	**Real Materials Import**	**Gross Profit**	**Gross Output**	**Real Materials Import**	**Gross Profit**
Food and Bev.	155,000	34,600	85,800	48,300	11,200	22,800
Garments	6,150	706	2,140	5,840	681	2,030
Furniture	20,200	925	9,420	11,700	752	5,560
Metal and Mach.	73,600	21,100	27,700	35,800	8,040	14,000

Source: Author's calculations from RPED, GMES dataset.

Similar to the findings of Wagner (2014) and Fryges and Wagner (2010), exporters are found to be more profitable in comparison to domestically oriented firms for the entire dataset as shown in Table 8.19 based on the average net profit margin. Likewise, Ghanaian firms into exporting are much profitable than non-exporters. This observed profitability differences between exporters and non-exporters are at variance with the findings of Grazzi (2012) and Girma et al. (2004) who found no such distinction in their respective studies. In the same way, for all firms, importing firms are observed to be more profitable relative to non-importing firms. On the other hand, Ghanaian importing firms have been found to be largely less profitable relative to non-importing firms. Such an outcome could be due to the higher transportation cost incurred via international trade because of the increased geographical distance of foreign markets from local markets. Finally, exporting firms are generally observed to have higher profitability in terms of net profit margin than importing firms, hence, supporting the assertion that exporting firms are the most profitable (Srithanpong, 2014).

Table 8.19: Average Net Profit Margin Based on Trade Orientation.

Variable	**Mean(ln_NPM)**	**Std. Dev.**	**Observations**
All Firms			
Importers	3.30487	2.050.299	494
Non-importers	3.243893	2.184.606	679
Exporters	3.51588	1.819992	124
Non-exporters	3.240458	2.160.856	1049
Ghanaian Firms			
Variable	**Mean**	**Std. Dev.**	**Observations**
Importers	3.31441	2.083.612	378
Non-importers	3.331112	2.104.398	593
Exporters	3.864556	.8160169	85
Non-Exporters	3.272809	2.172.078	886

Source: Author's calculations from RPED, GMES dataset.

In Table 8.20, we report the findings on the relationship between tariffs and the type of firm ownership in line with equation 7.8. For local firms, the tariff variable is negative across the three measures of firm profitability, but significant for the GPM and NPM estimators at the 10% and 1% respectively as shown in models 1 and 3. This suggests that for such firms, falling tariffs are associated with improvement in firm profitability in terms of gross profit margin and net profit margin. For example, model 3 shows that a 10-percentage point tariff reduction is associated with a 16% increase in the net profit margin of firms and 7% in the gross profit margin of firms from model 1. Such an outcome is at variance with the findings of Breinlich (2016) and Baggs and Brander (2006) that lower tariffs results in lower profits for domestic firms in import competing industries in Canada.

Table 8.20: Tariffs and Firm-Level Profitability Based on Firm Ownership.

	Fully Owned Ghanaian Firms			Full/Partial Foreign Ownership		
	(1)	(2)	(3)	(4)	(5)	(6)
Dependent Variable:	ln_GPM	ln_GPE	ln_NPM	ln_GPM	ln_GPE	ln_NPM
ln Tariff	-0.7191*	-1.5698	-1.6454***	0.0839	0.3671	0.0375
	(0.4211)	(1.3026)	(0.6000)	(0.3416)	(0.9679)	(1.0119)
ln TFP	0.6046***	2.4470***	1.0284***	0.3458	1.7842***	0.7088*
	(0.1821)	(0.5005)	(0.2121)	(0.2301)	(0.5995)	(0.3918)
ln firm size	-0.2350*	-1.3775***	-0.1806	-0.3940	-1.7625	-0.5681
	(0.1333)	(0.3850)	(0.1914)	(0.3450)	(1.0934)	(0.4597)
exit	0.3384	1.0254	0.0410	0.2080	1.5531	-0.8608
	(0.2263)	(0.6309)	(0.3833)	(0.4062)	(1.0741)	(0.9484)
constant	5.9434***	17.5242***	7.5810***	5.7798***	21.6625***	5.6625
	(1.4199)	(4.2818)	(1.9884)	(1.7057)	(5.0412)	(4.0949)
year effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	971	971	971	202	202	202
No. of firms	118	118	118	27	27	27
R^2 (within)	0.0866	0.1227	0.1251	0.0810	0.1415	0.0844

Notes: (1) Fixed effects estimations with firm fixed effects, year effects and a sector effect via the TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) models 1-3 apply to fully owned Ghanaian firms whilst models 4 – 6 relate to fully or partially owned foreign firms, that is any foreign ownership (4) lnTFP is the total factor productivity (gross-output) (5) Significance at * 10%, ** 5%, *** 1%.
Source: Author's calculations from RPED, GMES dataset.

On the other hand, the tariff variable is positive for fully or partially owned foreign firms, suggesting that their profitability decline with declining tariffs. However, a concrete conclusion cannot be reached because of the insignificance of the coefficients across the three models displayed in Table 8.20. If this were the case, that would have implied that indigenous firms are more profitable relative to foreign firms, a deviation from expected results. Nonetheless, that would have been in line with the findings of Tørsløv et al. (2018) that domestic firms are more profitable than foreign firms in other countries whereas foreign firms are more profitable than local firms in tax havens. With respect to the relationship between productivity and

profitability, productivity is observed to positively influence domestic firm profitability. Also, firm size is negative and significant in models 1 and 2 for the GPM and GPE profitability measures as found in previous results reported in Tables 8.14 and 8.16.

The tariff profitability nexus of Ghanaian firms based on firm size in the spirit of equation 7.8 is presented in Table 8.21. Medium and large Ghanaian firms are found to gain positively from falling tariffs in terms of their net profit margin. For instance, models 3 and 4 show that a 10-percentage point reduction in tariffs is associated with a 17.9% and 17.6% gain in net profit margin of medium and large local firms at the 5% and 1% level of significance respectively. This shows that medium firms are the most profitable, supporting the outcome of Fernández et al. (2019) that medium firms earn the highest returns. For micro and small Ghanaian firms, the tariff variable though negative is not significant. Hence, the study does not provide any significant evidence on the effect of tariffs on the profitability of such firms. Also, across the different firm size specification, the results reveal a positive relationship between productivity and profitability of firms. This outcome therefore falls in line with the superior firm hypothesis of Demsetz (1973), which states that a direct relationship exists between firm productivity and firm profitability.

Table 8.21: Firm Size and Profitability (NPM) of Ghanaian Firms.

Dependent Variable: ln NPM				
	Micro	Small	Medium	Large
	(1)	(2)	(3)	(4)
ln Tariff	-1.7252	-1.0452	-1.7972**	-1.7665***
	(2.5474)	(1.4120)	(0.7945)	(0.5986)
ln TFP	1.0319***	0.8815**	1.6598***	1.1476***
	(0.3704)	(0.3833)	(0.5095)	(0.3981)
exit	-0.4519	-0.0530	0.7006	-0.8191
	(1.6205)	(0.5705)	(0.6197)	(0.5248)
constant	4.4813	5.3820	7.7331***	10.1814***
	(8.7581)	(4.7411)	(2.4311)	(1.9481)
year effect	Yes	Yes	Yes	Yes
Observations	158	382	333	98
No. of firms	38	74	64	19
R^2 (within)	0.1869	0.1107	0.1957	0.2965

Notes: (1) Fixed effects estimations with firm fixed effects, year effects and a sector effect via the TFP (2) Robust standard errors that are clustered at the firm level are in parentheses (3) lnTFP is the total factor productivity (gross-output) of Ghanaian firms (4) Significance at * 10%, ** 5%, *** 1%.

Source: Author's calculations from RPED, GMES dataset.

8.2.3 Tariff - Profitability Analysis using System GMM Estimator

Table 8.22 presents the tariff and firm-level profitability analysis in terms of Net Profit Margin for all firms in the dataset using the System GMM Estimation in line with the logic of equation

7.14. The key variable of interest, tariff is negative and significant across the eight model specifications as expected. For example, a 10-percentage point reduction in tariffs leads to a 24% gain in the net profit margin of firms at the 5% significance level as per model 1. This outcome corroborates the results of Mukherjee and Chanda (2016) that tariff reductions have positive effect on the profitability of firms in their study of the textile industry in India. Additionally, exporting firms witness higher gains in profitability compared to non-exporters. Specifically, models 5 and 6 show that exporting firms are about 70% and 56% mostly profitable relative to non-exporters at the 5% and 10% significance level respectively. As a result, the evidence adheres to the learning effect gains via exports. Further, the export share variable is positive and significant as well in model 7, implying that the export intensity of firms significantly improves their profitability. The positive association between exporting and profitability follow the conclusions drawn by Krugman et al. (2015), Ruane and Sutherland (2005) and Kambhampati and Parikh (2003). The imports share variable is negative and insignificant, hence no evidence on whether firms with more imports are largely better in terms of their net profit margin than non-importers.

Then again, the postestimation results reported in Table 8.22 are in line with expectations. The p-values of the test for first order autocorrelation are significant in all specifications as expected, depicting the presence of first order autocorrelation. For the test for second order autocorrelation, the insignificant p-values across all models show that there is no significant evidence of second order autocorrelation. Finally, the insignificant p-values of the Hansen test reported in Table 8.22 implies that we do not reject the null hypothesis on the validity of the overidentifying restrictions. All the model specifications therefore seem to be in order based on the test statistics reported.

Table 8.22: Tariffs and Firm Profitability (Net Profit Margin) for All Firms: System GMM Estimation.

Dependent Variable: ln NPM								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln NPM $_{t-1}$	0.2488**	0.3372***	0.2454**	0.2553***	0.2734***	0.3049***	0.2626**	0.3182***
	(0.0986)	(0.0975)	(0.0976)	(0.0952)	(0.0984)	(0.0879)	(0.1021)	(0.0902)
ln Tariff $_{t-1}$	-2.3778**	-2.3727**	-2.3684**	-2.3836**	-2.4130**	-2.3096**	-2.3094*	-2.1924**
	(1.0770)	(0.9905)	(1.0399)	(1.0392)	(1.2100)	(1.0516)	(1.2604)	(1.0088)
ln TFP $_{t-1}$	-0.0578	-0.0787	-0.0540	-0.0808	-0.0729	-0.0564	-0.0770	-0.0569
	(0.1069)	(0.0894)	(0.0992)	(0.1014)	(0.1222)	(0.0981)	(0.1307)	(0.0971)
ln firm size	-0.2206	0.0367	-0.2153	-0.0087	-0.2311	-0.0969	-0.0199	0.0024
	(0.4425)	(0.4347)	(0.4312)	(0.4556)	(0.4411)	(0.4052)	(0.4338)	(0.3658)
exit	-0.3443	-0.1799	-0.3211	-0.2200	-0.2294	-0.2586	-0.2928	-0.3269
	(0.4550)	(0.4654)	(0.4538)	(0.4549)	(0.4524)	(0.4517)	(0.4357)	(0.4428)
imports	-0.1268	0.0572						
	(0.3595)	(0.2548)						
ln Im_share			-0.0863	-0.0499				
			(0.0917)	(0.0819)				
exports					0.7050**	0.5664*		
					(0.2989)	(0.3042)		
ln Ex_share							0.1538*	0.1349
							(0.0864)	(0.0942)
constant	11.2463**	10.2578**	11.2849***	10.7615**	11.3084**	10.4995**	10.4394*	9.8139**
	(4.5474)	(4.2198)	(4.3447)	(4.4100)	(5.1719)	(4.3551)	(5.3735)	(4.1731)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	969	969	969	969	969	969	969	969
No. of firms	145	145	145	145	145	145	145	145
Instruments	21	36	21	26	26	36	26	36
AB 1(p-value)	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
AB 2 (p-value)	0.3754	0.3308	0.3586	0.4101	0.3270	0.2837	0.3602	0.2757
Hansen test (p-value)	0.1850	0.2816	0.1576	0.4070	0.4250	0.2937	0.4013	0.3040

Notes: (1) The instruments for specifications for all columns are: differenced equation, ln Tariff and ln NPM lagged 1 period, imports, exports, ln Im_share, ln Ex_share, ln Tariffs*Ims, ln firm size and exit, differenced year dummies; levels equation, first difference of ln Tariff and ln NPM, imports, exports, ln Im_share, ln Ex_share, ln Tariffs*Ims, ln firm size and exit (2) Robust standard errors in parentheses (3) lag limits are (1 1) for models 1 and 3; (1 4) for models 2, 6 and 8; and (1 2) for models 4, 5 and 7 (4) The null hypothesis underlying the autocorrelation test is that there is no autocorrelation (5) AB 2 is a test for second order serial correlation (6) Significance at * 10%, ** 5%, and *** 1%.

Source: Author's calculations from RPED, GMES dataset.

In Table 8.23, the results of the association between tariffs and net profit margin for local and foreign firms on the basis of equation 7.14 are displayed. As reported earlier in the fixed effects results in Table 8.20, Ghanaian firms are found to benefit significantly from tariff reductions with regards to their net profit margin. Across all the model specifications, the tariff variable is negative but significant in the case of indigenous firms. It can be observed from model 1 that tariff reductions results in a 20% increase in the net profit margin of local firms at the 5% significance level. In terms of importing or import share and net profit margin, a negative relationship was observed, meaning that importing or import intensive firms are not largely better off than non-importers in terms of their net profit margin. Such results are however insignificant. The results were not significant when the GPM measure was employed (see Table E.2 in Appendix E).

Here again, the postestimation results are in order for all models except model 8, a model that does not report any significant values for any variable. From the p-values of the AR (1) and AR (2), we reject the null of no first order autocorrelation and a non-rejection of the null of no second order autocorrelation. Also, the insignificant p-values of the Hansen test means that we do not reject the null hypothesis.

Table 8.23: Tariffs and NPM: System GMM Estimation.

Dependent Variable: ln NPM

	Fully Owned Ghanaian Firms				Full/Partial Foreign Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln NPM $_{t-1}$	0.3913***	0.4076***	0.3871***	0.3798***	0.2514**	0.3007	0.2709*	0.1496
	(0.1055)	(0.1026)	(0.0944)	(0.0898)	(0.1151)	(0.1989)	(0.1399)	(0.1377)
ln Tariff $_{t-1}$	-2.0170**	-1.4663**	-1.5016**	-1.3262*	-2.2340	-2.2443	-5.3512	-2.1741
	(0.8201)	(0.6892)	(0.6945)	(0.7905)	(5.5128)	(4.8020)	(5.5365)	(6.5290)
ln TFP $_{t-1}$	0.0521	0.0278	0.0200	0.0124	-0.0501	-0.0202	-0.0673	-0.1687
	(0.0530)	(0.0418)	(0.0440)	(0.0556)	(0.2274)	(0.1664)	(0.1749)	(0.1692)
ln firm size		0.1064	0.0787	-0.0244		-0.9622	-0.8108	-0.0936
		(0.2230)	(0.2241)	(0.1676)		(0.8307)	(1.0427)	(0.8922)
exit		0.2136	0.2385	0.2315		-1.7850	-1.4733	-1.0263
		(0.3432)	(0.3453)	(0.3595)		(1.3680)	(2.5148)	(1.0760)
imports			-0.0674				-0.6123	
			(0.2089)				(0.8750)	
ln Im_share				-0.0577				2.8417
				(0.1916)				(5.0730)
ln Tariffs*Ims				-0.0053				-1.0048
				(0.0684)				(1.8850)
ln Ex_share				0.0900				0.6432
				(0.0642)				(0.6288)
constant	8.7249***	6.6571***	6.9556***	5.7626**	7.3070	12.1925	20.7525	9.2388
	(2.6933)	(2.4943)	(2.5359)	(2.4148)	(11.7817)	(11.7753)	(17.0084)	(15.2836)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	795	795	795	795	174	174	174	174
No. of firms	118	118	118	118	27	27	27	27
Instruments	28	35	41	53	25	27	31	23
AB 1(p-value)	0.0001	0.0001	0.0001	0.0002	0.0445	0.0802	0.0467	0.1272
AB 2 (p-value)	0.3773	0.3580	0.3632	0.2858	0.5402	0.6326	0.7211	0.9688
Hansen test (p-value)	0.2231	0.3135	0.5674	0.3853	0.4034	0.2743	0.6362	0.7541

Notes: (1) The instruments for specifications for all columns are: differenced equation, ln Tariff , ln NPM and ln TFP lagged 1 period, imports, ln Im_share, ln Ex_share, ln Tariffs*Ims, ln firm size and exit, differenced year dummies; levels equation, first difference of ln Tariff, ln NPM and ln TFP, imports, ln Im_share, ln Ex_share, ln Tariffs*Ims, ln firm size and exit (2) Robust standard errors in parentheses (3) lag limits are (1 5) for models 1 to 4; (1 4) for model 5; (1 3) for models 6 and (1 1) for model 8 (4)) models 1 – 4 apply to fully owned Ghanaian firms whilst models 5 – 8 relate to fully or partially owned foreign firms, that is any foreign ownership (5) The null hypothesis underlying the autocorrelation test is that there is no autocorrelation (6) AB 2 is a test for second order serial correlation. (7) Significance at * 10%, ** 5%, and *** 1%.
Source: Author's calculations from RPED, GMES dataset.

8.3 Synthesis of Research Questions and Findings

The primary aim of this thesis is to answer the question of how tariffs as a measure of trade liberalization affects firm productivity and profitability. The analysis on the tariff- productivity nexus disclose a very weak negative relationship for all firms from the System GMM estimations and no significant effect as per the FE estimations. For fully owned Ghanaian firms, a weak positive relationship between tariffs and firm productivity was reported via the System GMM estimations whereas the FE estimations did not depict any significant impact. Therefore, the empirical evidence does not show a significant relationship between tariffs and firm productivity in the Ghanaian private manufacturing sector. Probably, the private sector in Ghana is either not well developed or too small to take advantage of trade incentives. It is also possible that the private sector did not react much.to trade incentives because they felt they were not adequately consulted during the period of the economic reforms (Tangri, 1992). Indeed, Tangri (1992:110) reports that a former president of the Ghana Employers' Association mentioned that "For private investors, their supply response will be affected by the extent of opportunities made available for consultation and participation" by the state.

Nonetheless, the robustness check based on the indirect material cost TFP reveals a significant negative relationship for all firms as well as fully owned Ghanaian firms. For such firms, the negative tariff-productivity relationship suggests that increasing tariffs leads to lower productivity whilst decreasing tariffs results in higher firm productivity. Indeed, the positive effect of tariff reductions on firm productivity as evidenced in the current study falls in line with similar findings in previous studies focused on African countries such as Ackah et al. (2012a) on Ghanaian manufacturing firms, Abreha (2014) and Bigsten et al. (2016) for manufacturing firms in Ethiopia and studies broadly focused on Sub-Saharan African countries (Nyantakyi and Munemo, 2014; Foster-McGregor et al., 2016). Additionally, the tariff-productivity findings confirm the results of similar studies carried out in other developing countries outside Africa (Yu, 2014; Topalova and Khandelwal, 2011; Amiti and Konings, 2007; Pavnick, 2002) as well as those conducted in developed countries such as Halpern et al. (2015) for Hungarian firms and Hansen (2010a) for German and Austrian firms. Subsequently, for the entire dataset, the outcome of the tariff-productivity relationship supports the argument that opening up via reducing tariffs is associated with gains in productivity (De Loecker, 2011). Hence, validating the calls for the removal of barriers to trade as advocated by proponents of free trade.

On the other hand, a different picture is presented when we isolate fully owned Ghanaian firms and examine the tariff-productivity relationship for such firms separately. Contrary to the theoretical arguments discussed in chapter four and earlier evidence in the literature that falling tariffs have a positive impact on domestically owned firms, such is not the case per the results of the current study when materials cost is employed as proxy for unobserved productivity. Therefore, for fully owned Ghanaian firms, there is no evidence of any significant effect of declining tariffs on firm productivity. As a result, arguments put forth in favour of protectionism by its advocates appear plausible. In contrast to this outcome, a positive effect of tariffs on firm productivity was found when indirect materials cost serves as proxy for unobserved productivity. In this case therefore, declining tariff was observed to impact firm productivity positively, thereby supporting previous studies and arguments by pro-free trade proponents that tariff reductions are beneficial to domestically owned firms. This notwithstanding, we conclude that falling tariffs do not improve the productivity of Ghanaian firms because raw materials imports rather than indirect material cost are directly affected by tariff changes.

From the foregoing, the study reveals that the type of ownership of firms, whether foreign or Ghanaian influences the productivity level of firms. Whereas the productivity of fully or partially owned foreign firms improve with falling tariffs, that of Ghanaian firms decline with declining tariffs. It appears therefore that tariff reductions are more beneficial to foreign firms compared to domestic ones. Probably, private indigenous firms did not respond adequately to tariff changes in comparison to their foreign counterparts. Indeed, the World Bank (1994:78) asserts that manufacturing growth in Ghana was slow in the cause of the economic recovery program due to "lagging private investments". This could be due to supply side constraints such as inadequate access to capital, high cost of borrowing, high cost of fuel and inputs, inadequate supply of inputs and inadequate technology. In fact, Aryeetey and Tarp (2000) opined that much attention was not paid to identifying what the private sector really needed in order to adequately respond to liberalization incentives. Rather, "It was assumed that the private sector would respond quickly and smoothly to revised incentive structures" targeted at it because of the belief that the public sector crowding out the private sector was the major problem (Aryeetey and Tarp, 2000:349).

Also, foreign firms enjoyed the most benefits from declining tariffs possibly because they are generally perceived to be more productive than their local counterparts as opined by Amiti and Konings (2007). The managerial skills employed by foreign firms is often deemed to be better

than those of domestic firms and could be a possible reason for the differences in the productivity of foreign and domestic firms. As a matter of fact, there were serious managerial capacity constraints in the 1990s in Ghana according to the World Bank (1994).

With regards to the effects of tariffs on firm profitability, the main findings reveal a significant positive effect of tariffs on profitability for local firms based on the net profit margin estimations. In other words, lower tariffs were found to be strongly associated with higher firm profitability in terms of net profit margin. Similar results were obtained when the analysis was carried out for all firms in the dataset. The positive tariff – profitability relationship outcome for local firms however runs counter to the evidence provided by Baggs and Brander (2006), Kambhampati and Parikh (2003) and Beng and Yen (1977) that lower tariffs results in lower profits for indigenous firms. The current findings as per the NPM therefore do not provide evidence in support of the argument put forth by Weisbrot and Baker (2003) that for local firms to be profitable, they must be protected. However, the results for full or partially owned foreign firms were not conclusive enough due to the insignificance of the tariff variable for such firms. This is probably because of the smaller number of observations of such firms.

In terms of whether exporters or importers are more productive than their non-counterparts, the findings reveal significant performance differences. In particular, exporting firms were found to be mostly productive and profitable compared to non-exporters, an indication of a possible learning by exporting hypothesis. Similarly, they were found to have superior performance relative to importing and non-importing firms. The export-productivity relationship falls in line with the findings of Bresnahan et al. (2016) and Ackah et al. (2012a) that export intensity is associated with gains in productivity for firms in Ghana. In a similar way, the current findings regarding export-productivity nexus support evidence provided by studies on Africa (Siba and Gebreeyesus, 2014; Fatou and Choi, 2013; Bigsten and Gebreeyesus, 2009; Van Biesebroeck, 2005; Bigsten et al., 2004) that found a positive relationship between exporting and productivity. In the case of importing however, non-importing firms appeared to be mostly productive as compared to importing firms. Hence, the findings could not validate the import by learning hypothesis. With respect to importing and firm profitability, evidence from the fixed effects estimations suggest a positive relationship for all firms in the dataset irrespective of the measure of profitability. Thus, denoting that importing firms are more profitable relative to their non-counterparts. An even greater effect was found for firms with high shares of imports. For fully owned Ghanaian firms, a firm's share of imports was much relevant in driving profitability based on the GPM and NPM estimators.

On the question of firm size and productivity, it was generally reported that size positively influences the productivity of firms regardless of the type of firm ownership. In other words, larger firms were more productive compared to smaller firms. Indeed, for local firms, the firm size-productivity relation was highly significant. Nevertheless, the same cannot be said with respect to firm size and profitability. Furthermore, the results indicate that falling tariffs are associated with declining productivity for micro firms that are fully owned by Ghanaians. With respect to profitability, declining tariffs were associated with an improvement in the net profit margin of medium and large firms. Hence, supporting the evidence by Mukherjee and Chanda (2016) that trade liberalization results in more profitable gains for larger firms. In all, firm size is a key determining factor of firm productivity and profitability. Furthermore, the study results depict a positive relationship between firm productivity and profitability irrespective of the measure of profitability. In light of this finding, the productive foreign firms should have been profitable whereas local firms will not be profitable since they were not found to be productive. Strikingly, the empirical findings reveal the opposite. In other words, the local firms were profitable whereas foreign firms were unprofitable. This notwithstanding, such an outcome supports evidence from Tørsløv et al. (2018) that domestic firms are more profitable in comparison to foreign firms in non-tax havens whilst foreign firms are more profitable in tax havens. Finally, there was strong evidence to suggest that exiting firms were less productive relative to surviving firms for the entire dataset. However, there is no significant evidence from the entire dataset that exiting firms are less profitable compared to surviving firms.

Lastly, the analysis carried out in this study have not been without limitations. A shortcoming of the current study has been that the regression analysis on productivity was not carried out based on the specific channels through which improvement in productivity occurs, namely variety, competition, learning and quality effects. Additionally, some studies in the past (Razzaque et al., 2003) examined the impact of trade liberalization on firm performance using data for both pre and post-liberalization periods. This approach was however not possible in the present study due to the lack of firm-level data for the pre-liberalization period.

9 CONCLUSIONS AND POLICY IMPLICATIONS

This section summarises the conclusions drawn from the study as well as the policy implications of the findings. First, the study findings are summarized, after which the policy implications are discussed. The chapter finally concludes with some possible future research.

9.1 Summary of Study Conclusions

The private sector has been identified by many others as a key player in delivering economic, social and environmental development in both developed and developing countries in recent years. It has been recognized as a means to accelerate the growth of economies globally and as a catalyst for helping developing countries achieve rapid industrialization as well as poverty alleviation and other developmental goals, they so much desire. In view of this, PSD became an integral part of Ghana's economic development strategy beginning with the structural adjustment programme of 1983 and has since been seen as the bedrock necessary for the development of the country. To this end, a number of initiatives meant to promote the private sector has been in place since the 1980s, ranging from institutional, trade and financial reforms. In this light, this thesis embarked on a detailed and comprehensive analysis of trade induced effects on firm productivity and profitability of manufacturing firms in the Ghanaian private sector between 1991 and 2001. To the best of the author's knowledge, this is the first study examining such a relationship with a focus on the private sector. Specifically, three key questions have been addressed. The first investigates the relationship between tariff reductions and productivity on the one hand, and the tariff-profitability nexus on the other. This aims to scrutinize changes in manufacturing firms' performance resulting from Ghana's trade liberalization in the 1980s. The thesis also explored the gains to firms based on their international orientation, i.e., if performance differences exist between firms engaged in either import or export activities. The final question analyses the role played by firm characteristics with respect to firm ownership (foreign or domestic owned), and firm size on firm productivity and profitability. In other words, it sought to answer the questions of whether foreign owned firms have superior performance in relation to their local counterparts and whether larger firms perform better than smaller ones.

The above questions were answered using secondary firm level data of 145 manufacturing firms in Ghana and taken from the RPED GMES dataset. The dataset is made available by the CSAE in Oxford, one of the institutions that was involved in gathering the data. Additionally, on the basis of data availability, average tariffs taken from the CEPII Tradeprod dataset was employed as the measure of trade liberalization. Productivity was measured by the total factor

productivity based on the gross output approach whilst profitability was determined using gross profit margin, net profit margin and gross profit per employee. The Levinsohn-Petrin methodology was employed in the estimation of the production function and productivity in order to minimize the effect of simultaneity and selections biases associated with using the OLS method. The productivity and profitability analyses were then carried out by means of fixed effects and system generalized methods of moments. The results of the production function reveal increasing returns to scale for firms in the food and beverages subsector whilst the remaining three sectors exhibit decreasing returns to scale.

The findings of the study suggest that trade liberalization has a significant impact on firm productivity and profitability. The general conclusion from the findings has been that tariff reductions does not result in productivity improvement for Ghanaian owned private firms. The main beneficiaries were rather partial or foreign owned firms. With regards to tariffs and profitability, local firms did benefit positively from falling tariffs. In terms of trade orientation, exporting firms had superior performance in both the productivity and profitability analysis but importing firms did not exhibit superior improvement in their productivity. However, the results show that for the entire dataset, importing firms are more profitable compared to non-importing firms. In the case of fully owned Ghanaian firms, the share of imports rather than the mere import status of firms was key in determining the profitability of firms. Firm size also played a key role in explaining both the productivity and profitability of firms. For micro firms owned by Ghanaians, declining tariffs are associated with lower productivity levels whereas declining tariffs are accompanied by profitability gains for medium and large Ghanaian firms. Finally, ownership of firms, that is whether, foreign or Ghanaian greatly influenced firm performance.

The findings as presented in Chapter 8 does not support the evidence that trade liberalization can increase firm level productivity via tariff reductions for local firms. In other words, the results are inconsistent with the general thinking of proponents of free trade in terms of the gains to be accrued by domestic firms as a result of liberalizing trade in the form of tariff cuts. Also, the results confirm the significance of firm ownership on the association between tariff reductions and firm productivity. In particular, foreign owned firms were observed to have enjoyed much benefits from declining tariffs than their Ghanaian counterparts. Perhaps they responded more positively to such trade changes than their domestic counterparts. Additionally, the managerial skills of the management, extent of technology, and the type of labour foreign owned firms employ could be some reasons for the differences in firm

performance between foreign and Ghanaian owned firms. Therefore, encouraging joint ventures or partnerships between foreigners and Ghanaians could allow for more domestic firms to stay more productive and profitable and thus benefit more from trade liberalization especially as the key targets of trade reforms. In addition, investment in education, technology and quality of labour force by domestic firms could better position them to respond adequately to trade reforms and thus accrue the right gains from such reforms. It was also observed that productivity has a large positive impact on the profitability of local firms.

Furthermore, the findings support the export by learning hypothesis because a strong positive relationship was established between exports and productivity, as well as exports and profitability. On the contrary, the evidence could not validate the import backed growth hypothesis for local firms. Firm size was a key determinant of firm productivity and profitability especially among local firms. It is however surprising that local firms gained in terms of their profitability from falling tariffs but had no improvement in their productivity from such tariff reductions. The general knowledge is that productive firms are more profitable whereas less productive firms are less profitable. Perhaps, the productive foreign firms were not profitable for tax reasons.

In view of the above discussions, it is necessary to bring into proper contexts that not everyone necessarily benefits from liberalizing trade as remarked by Stiglitz (2007). This is because reduced tariffs create its own problems as argued by proponents of protectionism such as reduced tariff revenue to government. Indeed, documented evidence from the World Bank (2005:4) reveal that "over the past 20 years, trade liberalization has been associated with a marked decline in trade tax revenue relative to GDP, in both developing and developed countries, and in all regions". However, so far as the net gains exceed losses that might be incurred by some firms, individuals or even the state, liberalizing trade can be preferred and encouraged. Nevertheless, we are not in a position to reach such a conclusion or otherwise because the current study does not examine the net gains or losses that accrue to an economy as a result of trade liberalization, but rather focusses on the impact of liberalizing trade on only private firms, hence the results must be interpreted as such. In fact, research shows that tariff revenue is a significant source of government revenue for the financing of government expenditure in most West African countries (Busse and Groβmann, 2007). Additionally, data from the World Bank (2005) shows that trade tax revenue typically make up about one-quarter to one-third of total tax revenue in low- and middle-income countries. Thus, a decline in government revenue via trade liberalization poses a serious financial challenge to governments.

This is especially more worrying since tax collection through other sources other than tariffs is quite problematic in developing countries. To compensate for such revenue losses, government could broaden the tax base as well as improve on the tax collection methods. In particular, effective and efficient tax collection is needed within the informal private sector.

9.2 Study Findings and Policy Implications

The empirical results have several and significant policy implications for Ghana. First of all, it raises serious concerns about the impact of liberalizing trade on the performance of Ghanaian owned private firms. On the one hand, it questions the significance of Ghana's trade reforms in stimulating the productivity of private indigenous firms, thereby downplaying the calls for further reforms in the form of declining tariffs. More importantly, the negative impact of declining tariffs on the productivity of privately-owned manufacturing firms cast doubts on the ability of the private sector, particularly in manufacturing to serve as the engine of economic growth in Ghana. Therefore, policy makers must rethink the idea of ultimately getting rid of tariffs in order to spur growth.

The results draw attention to strengthening the capabilities of indigenous firms to be competitive amid competition from foreign firms. Indeed, the findings point to indigenous firms being harmed in terms of their productivity as a result of increased import competition due to falling tariffs. This calls for competitive strategies, both at the firm and policy making (government) levels to improve the competitiveness of local firms. At the firm-level, it is proposed that Ghanaian firms focus on meeting local demands of consumers, especially that about 90% of firms studied served only the domestic market (see Table 6.4 in Chapter 6: only 10% of firms are engaged in exporting). Hence, by adapting their products to local preferences such that the products appeal to local taste, they will be able to build a market niche and wade off the competition from foreign firms. As part of focusing on domestic consumers, indigenous firms must improve their customer services by becoming more customer oriented.

For policy makers who are concerned about the potential drawbacks of trade liberalization on domestic firms in the developing world, this study provides great insights. First of all, the results reveal that all firms are not affected in the same way as a result of opening up to the world by way of lowering tariffs. The extent of effect varies with the size of the firm (that is whether micro, small, medium or large) such that the larger the firm, the lesser the negative effect and the smaller the firm, the higher the negative impact. In other words, micro and small enterprises were negatively affected due to lower tariffs with micro firms being the worst

affected as per the findings. As a result, from a policy point of view, rather than implementing wholesale policies, policy makers must tailor public policies to the needs of firms based on their characteristics such as size and their ability to cope or adjust to increasing competition.

Additionally, Ghanaian owned firms can improve upon their competitiveness by improving the quality of their products. Relative to products of local firms, foreign firms are said to produce superior products (Dawar and Frost, 1999). Therefore, to compete with foreign firms, products of indigenous firms must possess some quality that is comparative to the products of their foreign counterparts. Linked with improving quality is innovation – which falls in line with the strategy of innovation theory. In fact, the Bank of Ghana (2007) asserts that the lack of innovation in the Ghanaian manufacturing sector is a major factor accounting for the weak performance of the sector. Indeed, there is very little R&D investments in Ghana by the private sector. The latest available data from the World Development Indicators for the country's R&D expenditure as percentage of GDP was 0.4% in 2010, which compares unfavorably to 2.4 % in East Asia and Pacific, and 2.7% in North America (World Bank, 2019). Clearly, the spending on research and development is woefully inadequate and the private sector must commit more resources to such activities if they want to be competitive enough in a global environment. Private Ghanaian firms therefore need to be more innovative and move up in the value chain. A low-cost option could be the imitation of foreign technology. Also, a good legal environment that supports intellectual property rights/patent rights is needed to push up investments in R&D. Undeniably, technological changes are stimulated by the protection of intellectual property rights such as patents (Harvey, 2005).

Furthermore, there is the need for policy makers to introduce more export-led programs and implement them properly to boost the export capacities of domestic firms since the results reveal that only about 10% of firms in the dataset are engaged in exporting as against about 45% in importing. Such programs must however be easily accessible to all firms irrespective of their political affiliations in order to improve the growth of the manufacturing sector as well as avoid entry and exit of firms based on change of governments and therefore maintain the sector on a sustainable growth path. Additionally, a striking aspect of the results is the fact that exporting firms are the most productive and highly profitable in the economy, highlighting the importance of export markets and the need for firms to respond adequately to policies by taking advantage of changes in trade policy especially those regarding exports. Indeed, the findings show that Ghanaian owned exporting firms are about 60% largely more profitable in comparison to their non-exporting counterparts (see Table 8.15). Therefore, to benefit from

trade, policy makers must be interested in providing enhanced export opportunities for domestic firms since it appears that such opportunities outweighs the costs associated with export competition. In addition, a greater export orientation of the Ghanaian economy is expected to be associated with the generation of positive externalities to non-exporting sectors in the form of efficient managerial skills, improvement in production capacities and labour skills accumulation which are all vital for the long run growth of the economy. Further, the more outward the economy is, the higher the opportunities of economies of scale because exports are to the rest of the world, the biggest market. Therefore, even in situations where the purchasing power of domestic consumers is low, such scale opportunities will not be hindered.

At the moment, export promotion in Ghana especially non-traditional exports are led by a number of parastatal agencies. Key among them are the Ministry of Trade and Industry (MOTI); Ghana Export Promotion Authority (GEPA); Ghana Free Zones Authority (GFZA) and the Export Development, Agricultural and Industrial Fund (EDAIF). However, there appears to be a lack of coordination among such agencies leading to the duplication of efforts, misallocation and or waste of scarce resources. Existing programs under different agencies must therefore be synchronized and coordinated well in order to deliver the required benefits. Furthermore, to benefit from an export-led growth strategy via manufacturing, value-added manufacturing must be encouraged.

In view of the fact that local firms lag behind foreign firms and are unable to compete with them, a gradual approach to trade liberalization is recommended for Ghana in the wake of increased calls for trade openness. In actual fact, the study revealed that foreign firms enjoy the most benefits from declining tariffs in terms of productivity improvements as per Table 8.5 whereas the productivity of local firms do not witness any improvement from Tables 8.5 and 8.6, and Figure 8.1. It is therefore natural to have domestic firms lobby governments to protect them by imposing higher tariffs. At the same time, there are pressures on governments of developing countries like Ghana to open up their markets due to the assertions that opening up is more beneficial, and also to meet demands needed to access some foreign funding or foreign backed development projects. Subsequently, to satisfy the interest of both groups, it would be in the best interest of governments to strike a balance between protecting domestic markets in the form of restricting trade but not in its entirety and exposing domestic firms to foreign competition to some degree. In other words, a gradual process must be adopted whereby domestic firms are slowly introduced to high foreign competition as well as offering local firms

some incentives such as easy access to capital and advanced technology for them to be able to compete with their foreign counterparts.

Strategic elements of such a balance could include encouraging joint ventures between local and foreign companies, so both benefit from the advantages of each. This has the potential to sustain local jobs, hence avoiding the loss of local jobs and by extension unemployment. It is also good for local capacity building, because of access to top managerial skills, improvement in productivity and output, etc. As a matter of fact, the findings revealed that mixed companies, that is firms owned by both Ghanaians and foreigners did gain from tariff reductions as per Table 8.5. Secondly, restricting the number of foreign firms could be another way of reducing local firms' exposure to stiff competition that comes with the inflow of foreign firms as a result of liberalization. Then also, tariffs in sectors where local firms are less competitive relative to foreign firms could be increased to prevent the exit of local firms as a result of stiff competition. In like manner, tariffs in sectors where local firms are competitive enough should be reduced to allow domestic firms access foreign technology and knowledge which has the potential to increase their productivity and profitability through competition, learning, quality and variety effects.

Local firms can also merge to be bigger enough to withstand foreign competition. Indeed, the findings show that micro firms are the worst affected by foreign competition as a result of trade liberalization. It would therefore make economic sense for such firms to merge, become bigger so as to enable the firms to enjoy potential economies of scale effects, enable them to access more resources, thereby having a stronger force to be able to compete with foreign firms. Such mergers will therefore serve as a strong force to withstand or fend off foreign competition.

An issue worth solving if policy makers want to improve the productiveness of local manufacturing firms is the misallocation of resources. Research shows that the productivity of manufacturing firms in Ghana would have been at least 76% higher, if resources had been allocated efficiently as per the output-maximizing rule (Cirera et al., 2017). Indeed, the study of four Sub-Saharan African countries including Ghana by Cirera et al. (2017) reveal a severe resource misallocation in those countries such that resources are diverted from high productivity firms to low productivity firms. With such a resource misallocation in Ghana, it is therefore not surprising that the Ghanaian manufacturing firms in our dataset are not productive.

Moreover, the positioning strategies for local firms proposed by Dawar and Frost (1999) is very relevant to privately owned Ghanaian firms that want to survive foreign competition. According to them, the influx of foreign companies often appears as a death sentence to local firms in emerging markets that are dominant in protected markets. This is because of the advantages foreign firms have over local firms ranging from powerful brands, superior products, substantial financial and advanced technological resources to seasoned management skills (Dawar and Frost, 1999). Hence, Dawar and Frost (1999) proffer four strategic options to local firms in the midst of increased competition due to liberalization based on the firm's assets and the pressures to globalize. For industries that meet specific needs of customers and have an advantage in the form of closer and better relationship with domestic customers, they can still survive by concentrating on serving the domestic market even in the presence of foreign competition because foreign firms might have standardized products that are not tailored to the preferences of domestic consumers. They can focus on selling in the domestic market if they enjoy an advantage of closer and better relationship with domestic customers.

With regards to the competitive capabilities of firms, some might have assets that are best suited for them to operate or serve the domestic markets such as having well established distribution networks that allow them access remote areas and a better knowledge of the specific preferences of domestic consumers. Such advantages allow them to operate only in the domestic markets. This can constitute a source of competitive advantage against foreign firms since they cannot copy or imitate these advantages within a short period of time. Therefore, by taking into consideration the competitive assets of a company or the pressures to globalize, local firms have a variety of unique strategic responses to foreign competition in domestic markets that can ensure their survival and growth in the long term amidst foreign competition. Dawar and Frost (1999) classified these coping strategies for local firms into four: dodger, contender, defender and extender as shown in Figure 9.1. In their view, a firm is a dodger if its competitive assets can be customized to its local market amid a high pressure to globalize. So, for such firms, focusing on an advantage in the value chain might be beneficial. Otherwise, such firms will be better off if they sell out to multinationals or enter into joint ventures with foreign firms seeking to enter the domestic market. Alternatively, they can focus on penetrating into markets in which foreign firms have weak positions.

Figure 9.1: Positioning Strategies for Emerging Economies.

Pressures to Globalize in the Industry	Competitive Assets: Customized to Home Market	Competitive Assets: Transferrable Abroad
High	**Dodger Strategy** Focuses on a locally oriented link in the value chain, enters a joint venture, or sells out to a multinational.	**Contender Strategy** Focuses in upgrading capabilities and resources to match multinationals globally, often by keeping to niche markets.
Low	**Defender Strategy** Focuses on leveraging local assets in market segments where multinationals are weak.	**Extender Strategy** Focuses on expanding into markets similar to those of the home base, using competencies developed at home.

Source: Dawar and Frost (1999).

In the case of a firm classified as a defender, its success lies with concentrating on the advantages it possesses in the domestic market. That is, such firms must tune in their products to the unique needs of the customers they serve in the face of severe foreign competition. Hence, they must resist the temptation of reaching out to all potential customers or imitating foreign firms. Rather, they must focus on the customers who appreciate a local touch and are loyal to such local preference whilst ignoring those that prefer a global brand. This is because the pressure to globalize is low for defenders and therefore they can customize their products to the home market especially in segments where foreign companies are weak. In other words, defenders must protect their existing market position against foreign entrants by capitalizing on the comparative competitive advantage in domestic markets they possess over foreign firms. For example, taking advantage of lower salaries and low operating cost in domestic markets.

Unlike defenders who must concentrate on the domestic market, extenders can extend into foreign markets that have similar characteristics as their home markets by capitalizing on their home-based competencies. This is because they have competitive assets that can easily be transferred abroad even though the pressures to globalize is low for such firms. Similar to extenders, contenders, which are firms that find themselves in industries with a high pressure to globalize and with competitive assets that are transferable abroad can concentrate on upgrading their capabilities to match up to multinationals globally. Strategically, Ghanaian firms that fall under extenders and contenders can also form some alliances with foreign firms in order to have easy access to well established distribution networks of their foreign partners in foreign markets. Furthermore, as a starting point, Ghanaian extenders can first expand into

African markets such as Togo, Benin, Burkina Faso, Ivory Coast and Nigeria due to geographical proximity and similarities in the regulatory environment and consumer preferences especially in the light of the coming into force of the African Continental Free Trade Agreement.

In a nutshell, Ghana's private sector, considered as the main driver of the economy is characterized by micro, small and medium enterprises and highly informal. It is therefore recommended that policy makers make the removal of barriers to growth of micro and small enterprises a topmost priority. In general, Ghana's formal private sector is relatively small; accounting for a very small share of private sector employment of about 2% (Francis and Honorati, 2016). There is therefore the need to increase the size of the formal private sector by making the documentation and registration processes less cumbersome. It is true that the private sector in Ghana has made some significant strides over the years, it is however also plagued with some challenges. Key among them are the lack of access to information on external markets and inadequate physical infrastructure (Arthur, 2006). A lack of infrastructure means higher transportation costs, unreliable and expensive supply of electricity and communications services, this hampers the growth of firms. Therefore, trade liberalization without the requisite infrastructural development such as roads, ports, power supply and communication services will not necessarily lead to more development (Stiglitz, 2007).

High utility rates increase the cost of production, making it very expensive to do business in any country. Likewise, frequent power outages pose a major challenge to the growth and productivity of firms especially those in the manufacturing subsector. However, Ghana's manufacturing sector is highly constrained by high utility rates and frequent power outages. As per the World Bank's doing business report, Ghana scored zero on the reliability of power supply and transparency of tariff index, an index that ranges from 0 – 8 where higher values indicate greater reliability of supply and transparency (World Bank, 2017). Additionally, Ghana's score on total duration and frequency of outages per customer (scores are from 0 – 3) from the same 2017 report was zero. These zero scores of Ghana in such key indexes signal the high extent to which power supply and outages hamper the production of firms especially those in manufacturing in the country. Therefore, to improve firm performance in the manufacturing sector, firms' accessibility to reliable and uninterrupted power supply must be a major priority for policy makers.

Moreover, the acute shortage of managerial personnel in local firms poses a severe constraint to the performance of manufacturing firms in the private sector in Ghana. In fact, access to seasoned marketing and management skills serves as a major advantage enjoyed by foreign firms over their domestic counterparts (Dawar and Frost, 1999). Management training should therefore be a topmost priority of local firms and policy makers must also offer opportunities for private Ghanaian firms to build and improve the capacities of their human resources because the 2003 national industrial census reveals that only about 4.9% of workers in the manufacturing sector have managerial expertise (see Table 2.3). Equally important, employee training is necessary to augment or supplement the efforts of good managers. Without a critical mass of well-educated and trained human resource, managers will fail in their task of leading. As a result, employees within companies should be offered opportunities to upgrade their knowledge and skills as well as encouraged to practice coordination and management skills. In addition, employees with great potentials should be groomed within the company to be able to assume senior or managerial positions later.

Besides, when the private sector does not respond adequately to trade liberalization, then it fails to create jobs. This could arise if interest rates are quite high such that the private sector cannot afford the investments that are needed to create new jobs and therefore cannot lead to reductions in poverty. In effect, reforming trade in isolation of other factors such as interest rates, foreign exchange availability, stable currency and a general enabling business environment might not necessarily bring about the desired effects. Indeed, the Bank of Ghana (2007: 35) posits that the low productivity of manufacturing firms in Ghana over the year has been "characterized by financial constraints, high borrowing costs; outdated technology and lack of modern inputs; lack of skills; poor management practices; lack of innovation; poor infrastructure including energy supply". As a result, tariff reforms must be pursued together with complementary policy measures such as an enabling business environment, functioning financial market, good labour and product regulations, and infrastructural development to enable firms reap the full benefits of opening up to the world.

Finally, it is worth mentioning that data availability in developing countries such as Ghana remains highly problematic and poses a stumbling block for researchers in their efforts to carry out research in these areas. In fact, the firm level dataset employed herein suffers from missing data problems. Additionally, there are calls for the need to study the impacts of most recent rounds of trade liberalization (Rodrik, 1993). However, such data for developing countries are rarely available. This could be an interesting area of study especially in Ghana when such data

are available. Moreover, tariffs could have been constructed at the firm level, however, due to the unavailability of such data; sector level tariffs are mostly employed as done in the current thesis. However, firm level tariffs have the potential of shedding much light on the gains of international trade. Future research is thus required in this area for developing countries like Ghana when such data is available. The lack of adequate firm and trade data in Ghana raises concerns for the need to keep or maintain a database that records such information. If indeed, the state would like to have concrete impact evaluations of its policies as well as promote academic research, it is recommended that the Government of Ghana ensures that its institutions like the Ghana Statistical Service, the Ministries and the Customs, Excise and Preventive Duty of the Ghana Revenue authority keep up to date data of policy documents, reforms and also conduct regular surveys to gather data from firms etc. Moreover, it is perhaps high time that local firms took interest and invested in research.

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Appendix A: Appendix to Chapter 2.

Table A.1: Tax Rebates for Manufacturing Sector in Ghana.

Product exported	Before 1991	1991
5 - 15 %	25%	30%
16 - 25%	30%	50%
above 25%	60%	75%

Source: GATT, 1992.

Table A.2: Establishments and Persons Engaged in Manufacturing in Ghana by Region.

	Establishments		Persons Engaged	
Region	**Number**	**Percentage**	**Number**	**Percentage**
Ashanti	6,487	24.5	69,603	25.3
Brong Ahafo	1,791	6.8	15,456	5.6
Central	2,562	9.7	19,580	7.1
Eastern	3,026	11.4	25,531	9.3
Greater Accra	6,764	25.5	73,374	26.6
Northern	1,245	4.7	14,009	5.1
Upper East	849	3.2	5,794	2.1
Upper West	423	1.6	3,090	1.1
Volta	1,370	5.2	15,842	5.8
Western	1,976	7.5	33,216	12.1
Total Country	**26,493**	**100.0**	**275,495**	**100.0**

Source: Ghana Statistical Service (2006), 2003 National Industrial Census.

Appendix B: Appendix to Chapter 5

Table B.1: Firm Classification into Subsectors Based on ISIC (Rev. 2).

ISIC Code	Description	Abbreviation
312	Food products	Food
313	Alcohol	Beverages
322	Wearing apparel	Garment
332	Furniture except metal	Furniture
381	Fabricated metal products	Metal
382	Machinery except electrical	Machines

Source: Author's construct from RPED, GMES dataset.

Table B.2: Unit Root Test of Key Variables.

Variable	Z statistic		Z statistic(demeaned)	
	Level	***First Difference***	***Level***	***First Difference***
ln TFP	-6.8616***	-7.0102***	-5.6422***	-6.6672***
ln Tariff	-16.0511***	-17.5250***	-9.8705***	-10.3637***
ln gross output	-3.3880***	-4.2293***	-5.7610***	-6.1368***
ln Materials	-3.3286***	-3.6346***	-5.9405***	-6.5877***
ln Capital	-11.7847***	-12.4234***	-9.5913***	-10.0297***
ln Labour	-4.0250***	-4.5662***	-8.8761***	-8.9297***
ln Indirect cost	-9.3004***	-9.5937***	-9.5437 ***	-9.9421 ***
Firm size	-1.6891**	-2.3995***	-6.3952***	-6.8751***
import share	-1.6567**	-1.6565**	-13.3830***	-13.5891***
T*import share	-3.2833***	-3.3002***	-7.8523***	-8.7714***
export share	-1.5001*	-1.5792*	-16.0372***	-16.8458***
ln GP Margin	-8.0410***	-9.2806***	-7.6279***	-8.7339***
ln NP Margin	-9.9696***	-11.0820***	-8.9727***	-9.2722***
ln GP/employee	-7.5677 ***	-8.1292 ***	-8.9240 ***	-9.5267***

Source: Author's construct from RPED, GMES dataset.

Appendix C: Appendix to Chapter 6.

Appendix C.1: The Inverse Hyperbolic Sine Transformation Proposed by Johnson (1949).

$$\sinh^{-1} z = ln\left(z + \sqrt{(z^2 + 1)}\right)$$

Where z is the parameter to be transformed.

Appendix D: Appendix to Chapter 7.

Appendix D.1: Production Function Estimation using the Methodology of Levinsohn and Petrin (2003).

It is assumed that the production technology of a firm *i* is described by a Cobb Douglas production function as follows:

$$y_{it} = \beta_0 + \beta_l l_{it} + \beta_k k_{it} + \beta_m m_{it} + e_{it} + \omega_{it} + \eta_{it} \qquad (D.1)$$

Where lowercase denote that variables are in logarithmic form and y_{it} is measured as gross revenue. Labour (l), materials (m) and energy input (e) are considered freely variable inputs whilst capital (k_{it}) and the first error term, ω_{it} are considered as state variables and therefore impact on the input decisions of firms. To address the simultaneity bias that ensues thereof, the LP approach uses intermediate input demand to control for productivity shock. Hence, the

demand for intermediate input,m_{it} depends on the state variables ($k_{it}$and ω_{it}) of a firm. That is:

$$m_{it} = m_{it}(k_{it}, \omega_{it}) \qquad (D.2)$$

Furthermore, Levinsohn and Petrin (2003**)** assume that m_{it} is monotonic in productivity. Hence, it is possible to write the inverse of the intermediate demand function such that ω_{it} is a function of the observables (k_{it}, m_{it}) as follows:

$$\omega_{it} = \omega_{it}(k_{it}, m_{it}) \qquad (D.3)$$

Productivity is also said to follow a first- order Markov process:

$$\omega_{it} = [\omega_{it}|\omega_{it-1}] + \epsilon_{it} \qquad (D.4)$$

where $\epsilon_{it}$is an innovation to productivity that is uncorrelated with k_{it}, but not necessarily with l_{it}; hence, a source of simultaneity bias in the model.

Substituting equation D.3 into D.1, the production function can therefore be rewritten as:

$$y_{it} = \beta_0 + \beta_l l_{it} + \beta_k k_{it} + \beta_m m_{it} + \beta_e e_{it} + \omega_{it}(k_{it}, m_{it}) + \eta_{it}$$

$$= \beta_l l_{it} + \beta_e e_{it} + \phi_{it}(k_{it}, m_{it}) + \eta_{it} \qquad (D.5)$$

Where:

$$\phi_{it}(k_{it}, m_{it}) = \beta_0 + \beta_k k_{it} + \beta_m m_{it} + \omega_{it}(k_{it}, m_{it}) \quad (D.6)$$

The LP approach entails a two-stage estimation procedure. In the first stage, equation D.5 is estimated by means of OLS using third-order polynomial approximation in k_{it} and m_{it} in place of $\phi_{it}(k_{it}, m_{it})$. Estimates of coefficients are obtained from this process. In the second stage, we first estimate $\widehat{\omega}_{it}\ as$:

$$\widehat{\omega}_{it} = \hat{\phi}_{it} - \beta_k^* k_{it} - \beta_m^* m_{it} \qquad (D.7)$$

Based on the w_t s of each t, the residual for(β_k^*, β_m^*) is then computed as:

$$\widehat{\eta_{it} + \epsilon_{it}} = y_{it} - \hat{\beta}_l l_{it} - \beta_k^* k_{it} - \beta_m^* m_{it} - E\left[\omega_{it}\widehat{|\omega_{it-1}}\right] \quad (D.8)$$

This residual is supposed to interact with at least two instruments to identify both the $\beta_k\ and\ \beta_m$. if period t's capital stock is determined by the previous period's investment

decisions, it does not respond to shocks to this period's productivity innovation term ϵ_{it}, it provides the moment condition:

$$E[\eta_{it} + \epsilon_{it}|k_{it}] = 0 \qquad (D.9)$$

This condition is implicitly imposed in the objective function from (D.1). An additional moment condition is needed to identify β_m. separately fromβ_k. LP use the fact that the previous period's level of material usage m_{it} is uncorrelated with this period's error, giving the moment condition

$$E[\eta_{it} + \epsilon_{it}|m_{it-1}] = 0 \qquad (D.10)$$

Therefore, with$Z_{it} \equiv (k_{it}, m_{it-1})$, one candidate estimator solves

$$\underset{(\beta_k^* \beta_m^*)}{min} \sum_h \{\sum_t (\widehat{\eta_{it} + \epsilon_{it}}) Z_{ht}\}^2 \qquad (D.11)$$

with h indexing the elements of Zt.

Table D.2: Hausman Test for Fixed or Random Effects.

	Coefficients			
	(b)	(B)	(b-B)	sqrt(diag(V_b - V_B))
Variable	**fixed**	**random**	**Difference**	S.E.
ln Tariff	-.0170305	-.0148186	-.0022119	.0013238
Ex_share	.003342	.0031554	.0001866	.0001071
interaction	-.0000908	-.0000979	7.10e-06	1.63e-06
Im_share	.001757	.0018557	-.0000987	.0000305
firm size	.0034484	.0029784	.0004701	.0000912
exit	-.28211	-.281253	-.000857	.0014248
b = consistent under Ho and Ha; obtained from xtreg				
B = inconsistent under Ha, efficient under Ho; obtained from xtreg				
Test: Ho: difference in coefficients not systematic				
chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)				
= 39.81				
Prob>chi2 = 0.0000				

Source: Author's construct from RPED, GMES dataset.

Appendix E: Appendix to Chapter 8.

Table E.1: Tariffs and Productivity, Lags for Ghanaian Importing Firms: System GMM Estimation.

Dependent Variable: ln TFP (Ghanaian Firms)								
	Tariffs lagged 7 years				Tariffs lagged 5 years			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln TFP $_{t-1}$	1.1252***	1.2902***	1.0514***	1.0326***	0.9825***	0.9872***	0.9935***	1.0649***
	(0.1621)	(0.2711)	(0.0373)	(0.0238)	(0.0230)	(0.0513)	(0.0360)	(0.0989)
ln Tariff $_{t-7}$	-0.5478	-1.4236	-1.1358*	-0.9295**				
	(0.9702)	(1.4628)	(0.6186)	(0.4408)				
ln Tariff $_{t-5}$					-0.4249	0.0094	-0.3242	0.5785
					(0.3352)	(0.4261)	(0.3412)	(0.6761)
ln Im_share		0.0938	0.1053	0.0540			0.0160	0.5415
		(0.1267)	(0.1242)	(0.1159)			(0.0400)	(0.5214)
ln firm size		-0.1078	-0.1589	-0.1523		0.2120	0.1073	0.1247
		(0.3548)	(0.1144)	(0.1426)		(0.1547)	(0.1693)	(0.1953)
exit		-0.2220	-0.1177	-0.0091		0.0844	0.0597	0.2733
		(0.6714)	(0.5369)	(0.3568)		(0.1775)	(0.2967)	(0.3511)
lnTariffs*Ims			-0.0347	-0.0180				-0.2083
			(0.0485)	(0.0513)				(0.1876)
constant	0.0000	0.0000	4.1847**	0.0000	0.0000	-0.8281	0.4811	0.0000
	(.)	(.)	(2.0240)	(.)	(.)	(1.6737)	(1.3302)	(.)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	76	76	76	76	138	138	138	138
No. of firms	39	39	39	39	60	60	60	60
Instruments	14	25	40	35	25	19	31	27
AB 1(p-value)	0.0650	0.0541	0.0647	0.0608	0.0425	0.0395	0.0411	0.0760
AB 2 (p-value)	0.2021	0.7416	0.6156	0.5397	0.3072	0.3047	0.3072	0.3157
Hansen test (p-value)	0.1744	0.3727	0.4800	0.4928	0.1382	0.0894	0.1690	0.1003

Notes: (1) The instruments for specifications for all columns are: differenced equation, Lag (1/3) of ln lag Tariff, ln lag TFP, lnIm_share, ln Tariff*Ims, ln firm size and exit, differenced year dummies; levels equation, first difference of the first lag of ln Tariff and ln TFP, lnIm_share, ln Tariff*Ims, ln firm size and exit (2) Robust standard errors in parentheses (3) lag limits are (1 4) for models 1 and 2; (1 6) for model 3; (1 5) for models 4, 5 and 7; (1 3) for models 6 and 8 (4) The null hypothesis underlying the autocorrelation test is that there is no autocorrelation (5) AB 2 is a test for second order serial correlation (6) Significance at * 10%, ** 5%, and *** 1%.

Source: Author's calculations from RPED, GMES dataset.

Table E.2: Tariffs and GPM: System GMM Estimation.

Dependent Variable: ln GPM	Fully Owned Ghanaian Firms				Full/Partial Foreign Firms			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ln GPM $_{t-1}$	0.4084***	0.3991***	0.3377***	0.4125***	0.5883**	0.4682*	0.4709**	0.4730**
	(0.1050)	(0.1077)	(0.0889)	(0.1306)	(0.2533)	(0.2533)	(0.2226)	(0.2058)
ln Tariff $_{t-1}$	-0.6449	-0.4640	-0.7671	-0.6932	-0.5286	-1.7961	-2.5211	-2.6974
	(0.4453)	(0.5255)	(0.5370)	(0.4944)	(1.4884)	(3.0509)	(3.5249)	(3.4283)
ln TFP $_{t-1}$	0.0114	0.0258	0.0354	0.0221	-0.0471	-0.0811	-0.1094	-0.1326
	(0.0330)	(0.0386)	(0.0357)	(0.0337)	(0.0666)	(0.1630)	(0.1711)	(0.1999)
ln firm size		0.0223	-0.1117	-0.0599		-0.0497	-0.1520	-0.2951
		(0.1472)	(0.1502)	(0.1184)		(0.5194)	(0.4837)	(0.5555)
exit		0.3710**	0.4325**	0.1746		-0.1973	-0.2303	-0.1059
		(0.1625)	(0.1704)	(0.1428)		(0.4232)	(0.4621)	(0.5557)
imports			-0.1793				0.3479	
			(0.1501)				(0.5504)	
ln Im_share				-0.0625				0.1481
				(0.1260)				(1.9531)
ln Tariffs*Ims				0.0187				-0.0043
				(0.0405)				(0.6564)
ln Ex_share				0.0241				0.2030
				(0.0495)				(0.3228)
constant	4.4803***	3.7341*	5.4061**	4.8474**	2.8790	6.4462	8.2152	8.9679
	(1.6327)	(2.0604)	(2.0996)	(2.0686)	(4.0976)	(9.0740)	(9.5007)	(8.5675)
year effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	795	795	795	795	174	174	174	174
No. of firms	118	118	118	118	27	27	27	27
Instruments	28	27	26	39	16	19	21	23
AB 1(p-value)	0.0028	0.0026	0.0020	0.0063	0.2715	0.3672	0.2951	0.2976
AB 2 (p-value)	0.7807	0.7934	0.8628	0.7697	0.3236	0.3296	0.3106	0.3094
Hansen test (p-value)	0.1069	0.1875	0.7065	0.1889	0.8470	0.7616	0.9003	0.9562

Notes: (1) The instruments for specifications for all columns are: differenced equation, ln Tariff and ln GPM lagged 1 period, imports, lnIm_share ln Tariffs*Ims, ln Ex_share, differenced year dummies; levels equation, first difference of ln Tariff and ln GPM, imports, ln Im_share ln Tariffs*Ims, ln Ex_share (2) Robust standard errors in parentheses (3) lag limits are (1 5) for model 1; (1 3) for models 2 and 4; (1 2) for model 3 and (1 1) for models 5 to 8 (4) The null hypothesis underlying the autocorrelation test is that there is no autocorrelation (5) AB 2 is a test for second order serial correlation (6) Significance at * 10%, ** 5%, and *** 1%.

Source: Author's calculations from RPED, GMES dataset.

Curriculum Vitae]

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ACADEMIC BACKGROUND

Degree	Name of Discipline	Institution	Country	Date
PhD	International Development Studies	Ruhr University Bochum	Germany	August 2019
MBA	Financial Management	Coburg University of Applied Sciences	Germany	Oct. 2011
BSc	Economics and Business Administration	Catholic University College of Ghana	Ghana	May 2006
Senior Secondary School Certificate Examination	General Arts	Notre Dame Girls Senior High School	Ghana	August 2002

ACADEMIC, RESEARCH & INDUSTRIAL EXPERIENCE

Position held	Responsibilities	Organization/Department	Period (mm/yyyy to mm/yy)
Lecturer	Taught undergraduate level courses: Business Financial Management; Project Appraisal; Business Mathematics	Faculty of Economics and Business Administration, Catholic University College of Ghana	Oct. 2011 – Nov. 2013 Nov. 2013 – Now (on leave to study)
Intern – Aftersales Finance	Monitored sales and development, price and competitive environment for highly	Aftersales Finance, Adam Opel GmbH, Rüsselsheim, Germany	Sept. 2010 – Feb. 2011

	competitive commodity products and analyzed competitive data per market out of various databases		
Tutor	Assisted a Senior Lecturer to teach Mathematics for Business and Economics	Faculty of Economics and Business Administration, Catholic University College of Ghana	Sept. 2007 – Sept. 2011
Teaching Assistant	Carried out tutorials in Mathematics for Business and Economics	Faculty of Economics and Business Administration, Catholic University College of Ghana	Jan. 2007 – Aug. 2007

DESCRIPTION OF ACTIVITIES AT ACADEMIC INSTITUTIONS
Provide details of published papers and other relevant activities.

Publications

1. **Hoedoafia, M. A.** (2019). The Impact of Trade on the Productivity of Ghanaian Manufacturing Firms: Insights from the Private Sector. Under preparation
2. **Hoedoafia, M. A.** (2019). Trade Liberalization and Firm Profitability: Evidence from Ghana's Manufacturing Sector. Under preparation.
3. Agbozo, G. K., Owusu, I. S., **Hoedoafia, M. A.** and Atakorah, Y. B. (2017). The Effect of Work Environment on Job Satisfaction: Evidence from the Banking Sector in Ghana. Journal of Human Resource Management, 5(1), 12 – 18.
4. Alhassan, E. A., **Hoedoafia, M. A.** and Braimah, I. (2016). The Effects of Microcredit on Profitability and Challenges of Women Owned SMEs: Evidence from Northern Ghana. Journal of Entrepreneurship and Business Innovation, 3(1), 29 – 47.
5. Alhassan, E. A., **Hoedoafia, M. A**. and Alhassan, E. A. (2016). Determinants of SMEs Growth in the Tamale Metropolis using logistic regression. Business and Economics Research, 6(1), 324 – 336.
6. Alhassan, E. A., **Hoedoafia, M. A.** and Alhassan, E. A. (2016). Entrepreneurial Characteristics and Business Profile of Women Owned Small and Medium Enterprises (SMEs): A Case Study of the Tamale Metropolitan Area. Business Management and Strategy, 7(1), 159 – 173.
7. **Hoedoafia, M. A.,** Cheabu, B. N. S., and Korang, V. (2014). The Effects of Small Scale Gold Mining on Living Conditions: A Case Study of the West Gonja District of Ghana. International Journal of Social Science Research, 2(1), 151 – 164.
8. **Hoedoafia, M.A.** and Randall, V. J. (2013). Restarting Asset-Backed Securities and Current Developments in the Securitization of Financial Assets: The Case of the European Market. Research Journal of Finance and Accounting, 4(12), 97-108.

Conferences, Seminars attended and presentations

1. Volkswagen funded International and Interdisciplinary Research School for PhD Students and Postdocs (Political Science and Economics) with a focus

on Development Policy in Sub-Saharan Africa, Institute of Statistical, Social and Economic Research, Ghana. 14th January to 1st February 2019 with a **Presentation on: The Role of Export Processing Zones in Developing Countries: Insights from Ghana**.

2. PhD Conference on International Development, Ruhr University Bochum, Bochum, Germany. 8-9 November 2018 **with Poster Presentation: Tariffs and Firm-Level Productivity in Ghana.**
3. Ruhr University Bochum (RUB) Research School Workshop: How to Review Publications in your Research Field. 19th September 2016.
4. RUB Research School Workshop: Introduction to Leadership Skills. 1-2 March 2016.
5. RUB Research School Workshop: Advance your Teaching Skills in Higher Education. 17-18 November 2014.
6. Think Smart - Go Global: German-African Cooperation in Academia and Business; Bonn- Rhein-Sieg University of Applied Sciences, Rheinbach, Germany. 15th November 2014.
7. International Conference: Universities, Entrepreneurship and Enterprise Development in Africa; Bonn-Rhein-Sieg University of Applied Sciences, Rheinbach, Germany. 14th November 2014.
8. RUB Research School Workshop: Evaluation of Proposals for Doctoral Fellows from All Sections. 10th November 2014.
9. Research Day 2014: Developing a Successful Profile for an Academic Career; Ruhr University Bochum, Bochum, Germany. 6th November 2014. **with Poster Presentation: Effects of Public Policies on Private Sector Development: An Analysis of Ghana's Industry.**
10. Science College 2014: Relevance of Research. 1st July 2014.

Catholic Academic Exchange Services (KAAD) Seminars attended

1. Project Development and Project Financing: A Reintegration Seminar. Haus Venusberg, Bonn, Germany. 25 – 28 August 2016.
2. KAAD Seminar: Terrorism, Religious Radicalization and the Role of the Church in Africa. Ludwig-Windthorst-Haus, Lingen (Ems), Germany. 27 – 30 June 2016.
3. The Churches in Eastern Europe before the Problem of 'Tolerance'. Jugendburg Kolpinghaus auf Schonburg, Oberwesel, Germany. 26- 29 March 2015.
4. Time and Stress Management. Kloster St. Ludgerus, Helmstedt, Germany. 9 – 12 May 2014.
5. KAAD Annual Academy: Health without Limits? - "Global Health" in Cross-Cultural Perspective. Haus Venusberg, Bonn, Germany. 24 - 27 April 2014.
6. KAAD Seminar: "Football is our Life": Social-Psychological and Political Aspects of the Phenomenon of Football. Gastehaus im Arbeiterbildungszentrum, Gelsenl‹irchen, Germany. 27 – 30 March 2014.

Awards

- ESSER Stiftung, thesis completion scholarship (May – September 2018)
- Catholic Academic Exchange Services (KAAD) Scholarship Award, PhD studies (2013 – 2017).
- Catholic Academic Exchange Services (KAAD) Scholarship Award, Master's studies (2009 – 2011).

Declaration

I hereby declare that this submitted dissertation is entirely my own work and has been composed without having received unpermitted assistance, and that no sources have been used unless otherwise indicated, including entirely or partially included text excerpts as well as graphs, tables and the use of analysis software. Moreover, I declare that the submitted electronic version corresponds to the printed version of the dissertation and that it, in this or similar form, has not yet been submitted and assessed as a component of doctoral performance.

Mabel Akosua Hoedoafia

Bochum, Germany 2019