

Running head: EXPLORING THE BENEFITS OF STRONG INSTITUTIONS TO
GHANA



Exploring the potential benefits of strengthening institutions
to Ghana's economy: The case of full petroleum downstream sector deregulation in
Ghana.

Shedrach Gyeni Akesse

Thesis submitted to the Department of Business Administration, Ashesi University
College, in partial fulfilment of the requirements for the award of Bachelor of Science
degree in Business Administration.

April, 2016

EXPLORING THE BENEFITS OF STRONG INSTITUTIONS TO GHANA

Declaration

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

Candidate's Signature:.....

Candidate's Name: Shedrach Gyeni Akesse

Date: April, 2016

I hereby declare that the preparation and presentation of the thesis were supervised with the guidelines on supervision of thesis laid down by Ashesi University College.

Supervisor's Signature:.....

Supervisor's Name: Dr. Stephen Emmanuel Armah

Date: April, 2016

EXPLORING THE BENEFITS OF STRONG INSTITUTIONS TO GHANA

Acknowledgements

To the Lord of Hosts who is Father of all creation I show my profound gratitude for His loving-kindness, which was manifested in my health and intelligence throughout the preparation of this thesis.

To my supervisor, Dr. Stephen E. Armah, I say thank you for your relentless and timely efforts that helped deliver this work. I could not have succeeded without your precious supervision and profitable counsel.

My profound gratitude also goes to the following individuals for their immense contribution: My parents, Mr. Paul Gyeni Akesse and Mrs. Elizabeth Gyedu, and my four five siblings, Philomina, Dominic, Bernard, Grace, and Isaac; Dr. Ishmael Ackah, Africa Center for Energy Policy; Dr. Edward Abrokwa, Finance Ministry; Mr. Abass Tasunti, and Eunice Asiedua, National Petroleum Authority; Dr. Kofi Boahen, Imani Ghana; Prof. John Asafu-Adjaye, Institute of Economic Affairs; Kathryn Roe, Anansi Educational NGO; David Coady, International Monetary Fund; and Mr. and Mrs. Agbezudor family.

EXPLORING THE BENEFITS OF STRONG INSTITUTIONS TO GHANA

Abstract

According to the International Monetary Fund [IMF] (2013), energy reform efforts have been suspended in election years since the year 2000 by the various Ghanaian governments, making energy deregulation policy unsustainable. The IMF (2013) identified Ghana's Cedi depreciation as a cause of this phenomenon, signaling institutional weakness in Ghana's economy.

Thus, this research explores the potential benefits of strengthening institutions to Ghana's economy with regards to the full petroleum downstream sector deregulation.

A key research question is to investigate the strategic position of the National Petroleum Authority (NPA) in the deregulated petroleum downstream sector. Another question seeks to determine challenges Bank of Ghana faces in ensuring a sound and stable monetary policy.

The research design relies mainly on qualitative methods by employing qualitative data and some quantitative research techniques and data. The respondents included the NPA, the Finance Ministry, the Bank of Ghana, Imani Ghana, Association of Oil Marketing Companies, Institute of Economic Affairs, and Africa Centre for Energy Policy.

Key among the findings is that the Executive arm of government has the constitutional power to use certificate of urgency to alter market outcomes, especially when fuel prices are soaring beyond expectations.

Keywords: deregulation, institutions, economy, downstream, benefits, and Ghana.

EXPLORING THE BENEFITS OF STRONG INSTITUTIONS TO GHANA

List of acronyms and definitions

List of acronyms

ACRONYM	MEANING
ACEP	African Centre for Energy Policy
BDCs	Bulk Distribution Companies
GDP	Gross Domestic Product
IMF	International Monetary Fund
NPA	National Petroleum Authority
OMCs	Oil Marketing Companies
TOR	Tema Oil Refinery

List of definitions

NOUN	MEANING
Energy deregulation	Energy deregulation is defined in broad terms and encompasses privatisation, the sale or transfer of government assets to the private sector, and restructuring, the move towards more competitive markets; and this implies transition from regulated or controlled to market-based energy prices (Thierry Lefevre and Jessie L. Todoc, 1999) .
Institutions	Institutions are defined as the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interactions (North, 1991).
Downstream petroleum sector	Downstream petroleum sector encompasses importation, exportation, reexportation, shipment, transportation, processing, refining, storage, distribution, marketing and sale of petroleum products (NPA, 2015)

Contents

Declaration.....	I
Acknowledgements	II
List of acronyms and definitions	IV
List of definitions.....	IV
Chapter 1: Introduction	5
1.0 Introduction.....	5
1.1 History of deregulation policies in Ghana	8
1.2 Problem statement.....	12
1.3 Research questions.....	14
1.4 Research objectives.....	15
1.5 Significance of the research	15
1.6 Theoretical framework.....	17
1.7 Cognitive map.....	18
1.8 Thesis outline	20
Chapter 2: Literature review.....	21
2.0 Introduction.....	21
2.1 Deregulation theories and their predictions on economic performance.....	22
2.2 Implementation of deregulation policies in the international context.....	23
2.2.1 How subsidies mistargets the poor in Ghana	23
2.2.2 Subsidy and its effect on pollution.....	26
2.2.3 Effects of subsidy removal on households and the economy.....	27
2.3 Overview of subsidy allocation in the world	28
2.3.1 Deregulated industries in Africa	29
2.3.2 Empirical reasons for deregulation in Africa	30
2.4 Deregulation in the downstream sector in developing countries	31
2.4.1 Effect of rising fuel prices on oil importing economies.....	32
2.4.2 National currency performance and deregulation	33
2.5 Taxation of petroleum products and deregulation	34
2.5.1 Price adjustment challenges prior to full deregulation in Ghana	36
2.6 Overview of deregulation and relevance of institutions	39
2.7 The gap in the literature on deregulation	41

Chapter 3: Methodology.....	42
3.1 Overview of Methodology	42
3.2 Research Design.....	42
3.3 Research scope.....	44
3.3.1 Study population	44
3.3.2 Study area.....	44
3.4 Sampling Strategy	45
3.4.1 Sampling techniques	45
3.4.2 Sample size	45
3.5 Data collection	46
3.5.1 Data collection instruments.....	46
3.5.2 Data collection procedure	47
3.5.3 Data preparation, collation and processing	47
3.6 Data analysis	47
3.7 Validity and reliability	48
3.8 Ethical considerations	49
3.9 Limitations and delimitations	49
Chapter 4: Findings and Discussion.....	50
4.0 Introduction.....	50
4.1 The strategic position of the NPA.....	51
4.1.1 The deregulation policy on the performance of the OMCs.....	54
4.1.2 The deregulation policy on the performance of the BDCs	57
4.1.3 The nature of the petroleum consumption in the downstream industry	59
4.1.4 Petroleum products produced by the domestically in Ghana.....	60
4.1.5 Petroleum products imported in 2010.....	61
4.1.6 Historical supply of petroleum products	62
4.1.7 Distribution of petroleum product consumption per Region	63
4.1.8 Institutional challenge I: The strategic position of the NPA in monitoring the BDCs and BDCs	64
4.2 The pass-through of Ghana’s exchange rate shocks	67
4.2.1 Effect of Ghana’s exchange rate pass-through on petroleum prices	69
4.2.2 Bank of Ghana’s perceived challenges in implementing sound monetary policy	71

4.2.3 Measures in restoring the health of the monetary policy	72
4.2.4 Institutional challenge II: Ensuring sound monetary policy	73
4.3 Tax components of petroleum products.....	74
4.3.1 Institutional challenge III: The burden of taxation on petroleum products.....	75
4.4 Civil societies' role under deregulation	81
4.4.1 Institutional challenge IV: Impediments to the CSOs.....	81
Chapter 5: Conclusions and Recommendations	82
5.0 Conclusions.....	82
5.1 Recommendations.....	83
5.2 Appendixes.....	86
References.....	94

List of diagrams

Diagram 1. 1 The petroleum downstream sector of Ghana.....	7
Diagram 1. 2 Major factors that determined prederegulation ex-pump prices of fuel	9
Diagram 1. 3 Major factors determining ex-pump prices post full deregulation	10
Diagram 1. 4 Stakeholders' proposal of the relationship between deregulation and its benefits	19
Diagram 1. 5 Ideal proposal of the relationship between deregulation and its benefits.....	20
Diagram 3. 1 Interactions between the three major national institutions in the petroleum downstream sector.....	44

List of tables

Table 1. 1 Effects of newly imposed taxes on petroleum products	11
Figure 1. 1 The monetary policy rate of the Bank of Ghana from 2002 to 2015.....	13
Table 2. 1 Benefit incidence of fuel subsidies accruing to each quintile (in %).....	24
Table 2. 2 Budget shares and per capita subsidy amount per quintile	25
Figure 2. 1 International crude oil prices from 1995 to 2013.....	33
Figure 2. 2 Ghana: Fuel price developments, 2000-2012.....	37
Table 2. 3 Ten oil marketing companies and their quoted prices for petrol and diesel.....	38
Figure 2. 3 Best ten oil marketing companies and their quoted prices for petrol and diesel	38
Table 4. 2 Estimated cumulated pass-through coefficients	68
Table 4. 3 Variance decomposition of non-food inflation.....	70
Table 4. 4 Variance decomposition of non-food inflation.....	70
Table 4. 5 New taxes and levies on petroleum products.....	75
Table 4. 8 Size of double taxation on consumers	78

List of figures

Figure 4. 1 Market shares of major OMCs as at September 2015	55
Figure 4. 2 Market shares of major OMCs as at December 2014.....	56
Figure 4. 3 Oil marketing companies and their market shares as at December 2013	56
Figure 4. 4 Market shares of major BDCs as at September 2015	57
Figure 4. 5 Market shares of major BDCs as at end of 2014	58
Figure 4. 6 Market share of BDCs as at end of 2013	59
Table 4. 1 Percentage consumption of petroleum products in 2010.....	60
Figure 4. 7 Percentage of products produced by TOR.....	61
Figure 4. 8 Percentage of products imported by BDCs in 2010.....	62
Figure 4. 9 Trend of national supply of petroleum products in Ghana prior to deregulation.....	63
Figure 4. 10 Volume of all products consumed per Regions of Ghana	64
Figure 4. 11 Estimated cumulated pass-through coefficients	68

Chapter 1: Introduction

1.0 Introduction

According to Lefevre and Todoc (1999), energy deregulation is defined in broad terms and encompasses privatization, the sale or transfer of government assets to the private sector, restructuring, and the move towards more competitive markets. Thus, deregulation typically implies transition from regulated or controlled to market-based energy prices.

Basically, deregulation allows the forces of demand and supply to directly determine the economic outcome of an industry. In part, deregulation means that policymakers reallocate subsidies, which effectively leads to a decline in budget deficit. This is because, according to the international ratings agency, FitchRatings, the decision to sharply increase utility tariffs and scrap fuel subsidy reduces the risk of an overrun in coming fiscal years (Altenkirch, 2013). Another economic rationale for deregulation is to allow market participation in order to increase efficiency and reduce wastage. According to the African Centre for Energy Policy [ACEP] (2015), deregulation reduces the impact of persistent shocks and anxiety introduced into the market whenever the government regulates an industry.

Deregulation has been practiced by several international economies, producing varying results. For example, Harker and Price (2006) pointed out that the government of England reformed the English energy sector in the 1990s to allow market participation. Narrating the result of that reform, James and Stephen (2000) argued that the lack of

consideration for market power undermined the goal of that deregulation policy, leading to a regulatory backlash.

The International Monetary Fund [IMF] (2013) has indicated that in Latin America, Brazil and Chile were successful at implementing deregulation. IMF (2013) further identified that, in Africa, Uganda, Kenya, and South Africa have been successful at implementing full deregulation in electricity and fuel respectively. According to Winston (1998), federal regulatory agencies and the U.S Congress began liberalizing pricing, entry, and exit in the transportation, financial, energy, and communications industries in the United States of America during the mid-1970s.

For the purpose of this research, the focus is on Ghana, a sub-Saharan country that has since July 2015 fully deregulated her petroleum downstream sector. Ghana's petroleum downstream sector is categorized into three main sectors: the upstream, midstream, and the downstream. According to Armah and Torku (2016), Ghana currently is in commercial production of oil and gas, which commenced in late 2010.

According to the National Petroleum Authority [NPA] (2015), Ghana's downstream petroleum sector encompasses importation, exportation, re-exportation, shipment, transportation, processing, refining, storage, distribution, marketing and sale of petroleum products, and it contributes about 10% of Ghana's GDP. Ghana's sector starts from the Tema Oil Refinery, a state owned enterprise, and Platon Gas Oil Ghana Limited, a privately owned refinery. The sector ends with the final consumer, as identified in the diagram 1.1 below.

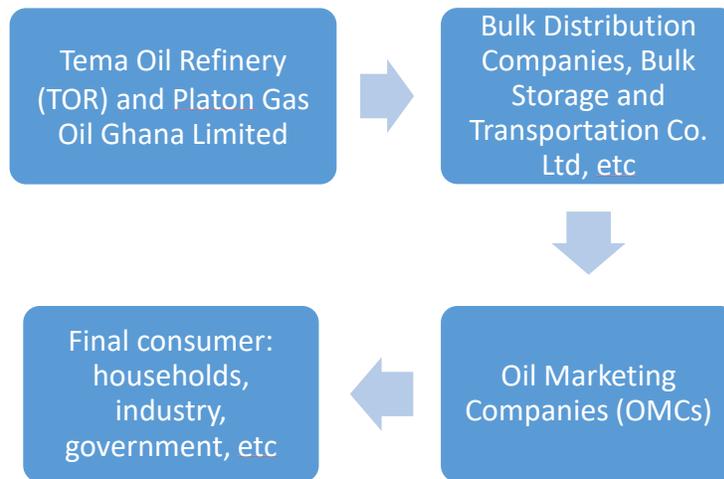


Diagram 1.1 The petroleum downstream sector of Ghana

Source: Researcher’s own diagram.

Diagram 1.1 shows that the petroleum products that are manufactured at the two refineries in Ghana, together with imports from the international markets, are distributed by the BDCs to the OMCs before the final consumer makes a purchase. According to the NPA (2015), there are about 137 OMCs and 28 BDCs currently operating in the downstream petroleum sector.

Ministry of Finance (2005) identified that, historically, Ghana’s downstream petroleum sector deregulation policy partially commenced on Friday 18th February, 2005, but that policy did not allow the market to set prices. The prices for petroleum products were arrived at on the basis of the existing pricing formula and were designed to realign prices with international prices for crude oil by the National Petroleum Authority. IMF (2013) has shown that since 2004, Ghana’s deregulation policy has allowed oil marketing companies to enter the market for importing and distributing crude oil and petroleum products. According to the NPA (2015), the full deregulation, which was the

final stage of Ghana's petroleum sector deregulation policy, was to result in the cessation of subsidies on fuel products.

Government's decision to fully deregulate the downstream sector was praised by key industry players and civil society organizations, including the National Petroleum Authority (NPA) and the ACEP. Benjamin Boakye, the Deputy Executive Director of the African Centre for Energy Policy, stated in a press release that "ACEP commends government for taking the decision to deregulate the downstream Petroleum sector."

Explaining the rationale behind the liberalization of the petroleum downstream sector, the Chief Executive officer of the National Petroleum Authority (NPA), Mr. Moses Asaga, said the full implementation of the deregulation of the petroleum downstream sector would promote competition among market players, and the issue of colossal subsidies which put a huge financial burden on the government, would also end, thereby result in the re-channelling of finances into other sectors of the economy (National Petroleum Authority, 2015).

1.1 History of deregulation policies in Ghana

According to the IMF (2013), until 2004, the Tema Oil Refinery (TOR) had a monopoly on the production and importation of refined oil products in Ghana. Since then, deregulation has allowed oil marketing companies (OMCs) to enter the market for importing and distribution of crude oil and petroleum products. IMF (2013) further revealed that under the current system, a pricing formula exists for all petroleum products; and the current price-adjustment mechanism is the result of partial reforms in 2005.

IMF (2011) indicated that under the partial deregulation system, the decision to adjust pump prices was at the discretion of the Executive. If the price increases are warranted but not implemented, the cost of subsidies is in principle borne by the budget. This phenomenon is shown in diagram 1.2 below.

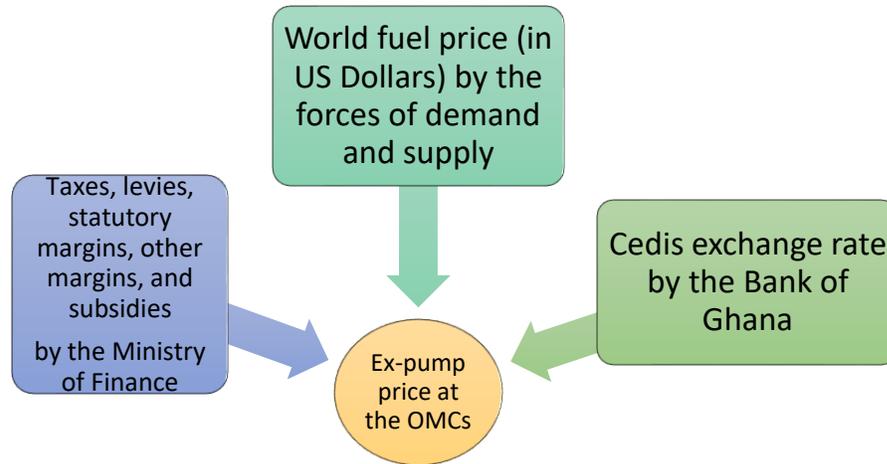


Diagram 1. 2: Major factors that determined prederegulation ex-pump prices of fuel

Source: Researcher’s own drawing

Note: Some of the institutions pertinent to the deregulation policy and their functions are clearly evident in Diagram 1.2.

It can be observed that under partial deregulation, the NPA considered taxes, levies, subsidies, margins, world fuel prices, and the market exchange rate to set the ex-pump and ex-refinery prices for the OMCs and Bulk Distribution Companies respectively.

However, IMF (2011) has indicated that in the past, the Tema Oil Refinery (TOR) carried the cost of the subsidy, and underpricing of petroleum products saddled TOR with large losses that spilled over into the financial sector in the form of non-performing loans. The government was forced ultimately to clear TOR’s arrears to the

banking sector at a large budgetary cost. Since October 2010, a hedging scheme using call options had also provided some temporary protection against upward movements in oil prices. The government purchased monthly call options that generated revenues in the event of upside shocks to global oil prices. These revenues were used to cover temporary delays in adjusting domestic petroleum product prices to cost-recovery levels.

The problems of the partial deregulation exercise such as large budgetary cost, underrecoveries, shortages of Dollar supply, and difficulties to issue Letters of Credits by the BDCs due to large exposures, and fuel shortages, motivated government to implement the full downstream sector deregulation. This phenomenon can be observed in diagram 1.3 below.

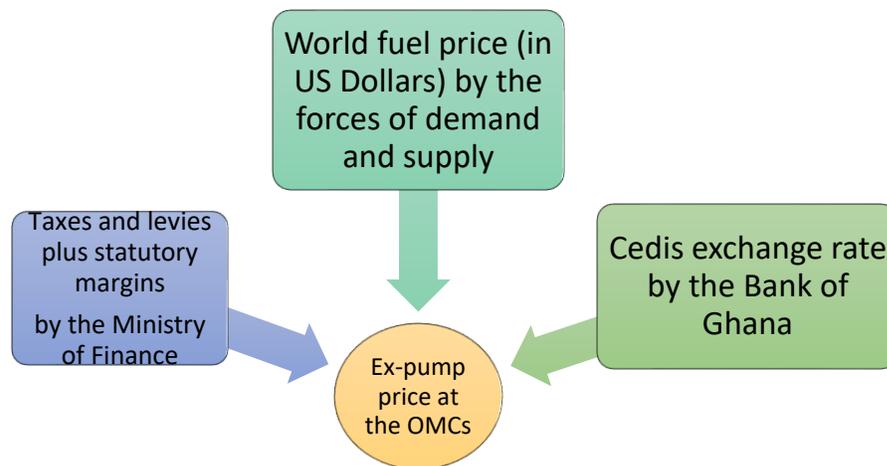


Diagram 1.3: Major factors determining ex-pump prices post full deregulation

Source: Researcher's own drawing

Note: Some of the institutions pertinent to the deregulation policy and their functions are also clearly evident in Diagram 1.3.

As indicated in the diagram above, the full deregulation exercise called for the complete withdrawal of subsidies, hence relieving the NPA of the responsibility to set petroleum products prices. Thus the various OMCs set their own prices by considering the world price of fuel, taxes, levies, and the exchange rate, for example.

As has been argued in the literature, stakeholders in the downstream sector have argued that the full deregulation policy is sufficient to tackle the challenges faced under the partial deregulation exercise. This is not entirely accurate since, for example, the government has the power to influence fuel prices through taxation to service debts and to meet its commitments like investments in infrastructure. Table 1.1 below captures the effects of the latest taxes imposed on premium, gas oil and LPG.

Product	Average market price (1 st Dec, 2015) GHp/Lt or KG	Estimated ex-pump prices (16 th Dec, 2015) GHp/Lt or KG	% change wrt to existing price
Premium	273.18	287.33	5.18
Gas Oil	266.40	274.12	2.90
LPG	280.83	285.71	1.74

Table 1.1 : Effects of newly imposed taxes on petroleum products

Source: Ministry of Finance (2016).

An analysis by ACEP (2016), however, pointed out that the effects of the levies on ex-pump prices are much greater and punitive. ACEP (2016) estimated that the levies have led to increase in the ex-pump price of petrol per liter by 33%, 40% on diesel per

liter and 22% on LPG per kg. The findings show that the downstream petroleum lacks consensus on information. Furthermore, the results also indicate a weakness in institutions.

1.2 Problem statement

According to the Institute of Statistical, Social and Economic Research [ISSER] (2015) indicated that Ghana's deregulation policy will allow for cost recovery and efficiency in the downstream petroleum sector as Bulk Distributions Companies (BDCs) and importers will price the commodity according to prevailing market prices to ensure that consumers get value for money, as reported by Paintsil (2015).

However, IMF (2013) has revealed that since the year 2000, governments have suspended subsidy reforms, resulting in large fiscal deficits. This recurring phenomenon has made any energy reform policy in Ghana ineffective and unsustainable.

Second, presenting the 2016 budget statement to Parliament in November 2015, Finance Minister Seth Terkper submitted that over the nine month period in 2015 beginning from January 2015, the Ghana cedi depreciated cumulatively by 14.8 percent, compared to a much higher depreciation of 31.2 percent in 2014, as reported by Ministry of Finance (2015). This phenomenon threatens the deregulation policy, in the researcher's view, since the exchange rate is one of the factors that determine ex-pump prices of petroleum products. This currency fluctuation was identified by IMF (2013) as a reason for suspending the subsidy reforms in Ghana. The monetary policy of Bank of Ghana could partly explain the performance of the exchange rate.

Figure 1.1 below illustrates Bank of Ghana’s exchange rate from 2002 to 2015, with the highest (27.50%) and lowest (12.50 %) rates being observed in years 2003, and 2007 & 2011. Currently, the rate stands at 26.0% (Bank of Ghana, 2016).

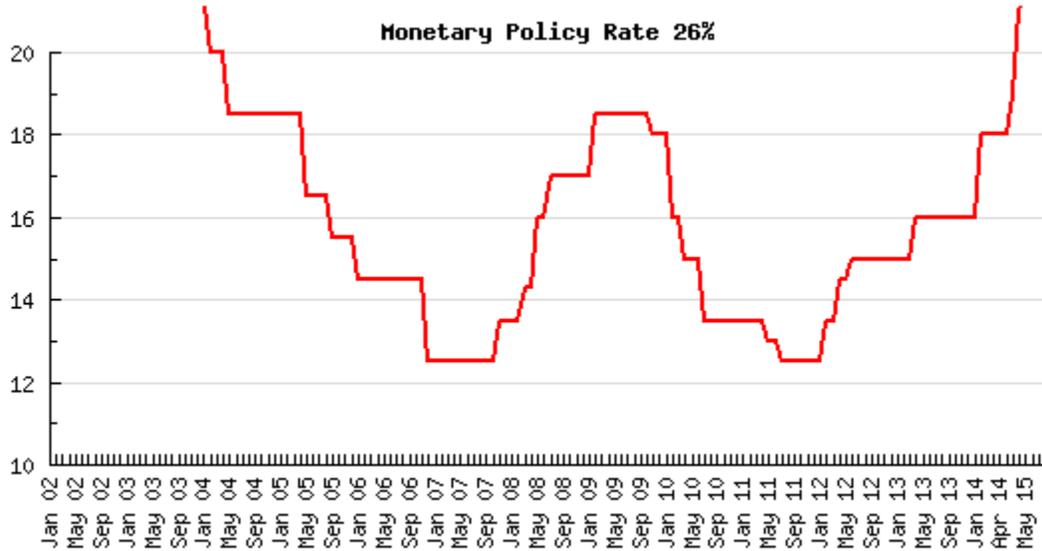


Figure 1. 1 The monetary policy rate of the Bank of Ghana from 2002 to 2015

Source: Bank of Ghana website (2016)

Where deregulation fails to yield expected results, the policy could lead to what is termed as re-regulation, where several other regulations are reintroduced. Bradburd and Ross (1991) broadly defined such a situation in which deregulation ends in the formulation and implementation of more regulations than it was before deregulation. The tendency to re-regulate arises when there are perceived market failures after the passage of deregulation measures. For instance, Bradburd and Ross (1991) observed that there had been calls for re-regulation of airline transport in the USA where certain industries had been deregulated. These calls had come from partly- and predictably- from those who

had experienced losses due to deregulations: airline labor groups, communities that have suffered reduced services, business travelers, and travelers on the less densely traveled and served routes. They have also come from those concerned with the evolution of deregulated monopoly or the deregulation of a market with significant market power.

Last but not least is the effect of tax components on petroleum products. For example, the introduction of taxes on petroleum could reduce the possibilities of consumers enjoying falling oil prices due to deregulation, as has happened in Ghana. The situation could be worse if international oil prices soar.

Therefore, it is the motivation of the author to explore how strengthening institutions in Ghana could make the deregulation policy beneficial to the economy.

1.3 Research questions

The research focuses on exploring the benefits of strengthening institutions in the downstream petroleum sector in the face of the full deregulation policy. Therefore, the research has the following questions.

1. How is the National Petroleum Authority positioned to exercise its role in the deregulated petroleum sector?
2. What is the pass-through effect of Ghana's exchange rate on domestic prices, and why is it challenging for the Bank of Ghana to implement a sound and stable exchange rate policy?
3. What are the key factors accounting for the higher effect of tax components on petroleum products, and how do these taxes affect petroleum consumers?

4. In what ways do civil society organisations contribute to make the deregulation exercise effective and sustainable, and what challenges are faced in the process?

1.4 Research objectives

The primary objective of this research is to explore the benefits Ghana would derive from strengthening institutions as the deregulation policy takes effect in the downstream petroleum sector. Thus the specific objectives are the following.

1. To investigate the strategic position of National Petroleum Authority in the deregulated petroleum downstream sector.
2. To ascertain the pass-through effect of Ghana's exchange rate on domestic prices, and to identify the challenges faced by the Bank of Ghana in implementing a sound and stable exchange rate policy.
3. To explore the key factors accounting for the high taxes on petroleum products, and how these higher taxes affect petroleum consumers.
4. To investigate ways civil society organisations contribute to make the deregulation policy effective and sustainable, and to identify some challenges faced in the process.

1.5 Significance of the research

First, the results of the research will help policymakers appreciate that deregulation is not sufficient; in fact, it may be naïve to deregulate the downstream petroleum sector, in anticipation of benefiting from the downstream petroleum sector. A lot of other complementary factors need to be considered.

There is need to consider other factors because the key stakeholders, particularly the government and the National Petroleum Authority (NPA), have stated that the deregulation policy would automatically promote fair competition, reduced prices, reduced budget deficit.

Despite this expectation, Stephen and James (2000) have cautioned policymakers that a move toward deregulation that does not take the issue of market power seriously can undermine the goals of industry restructuring and even, as in the case of England, produce a regulatory backlash, as cited from (Stephen Bushnell, 2000). This means that the existence of market power under deregulation could create negative externalities, unfair competitive practices, and consumer exploitation, which are unintended tendencies. Care must be taken in implementing the deregulation policy and effective monitoring and capacity building may be needed.

Second, this research makes the claim that the way forward towards making the deregulation policy prospering to the economy is to strengthen institutions, particularly economic institutions. For instance, ensuring that the management of the Central Bank is independent of the Executive or the Government may be a sound way of strengthening institutions.

Third, the research will help ensure that policymakers commit to full deregulation since governments over the years have been suspending subsidy reforms during election years.

Last but not least, the research will add to the body of literature on deregulation

and institutions.

1.6 Theoretical framework

A 2010 joint report prepared by The International Energy Agency (IEA), Organization of the Petroleum Exporting Countries (OPEC), Organization for Economic Cooperation and Development (OECD), and World Bank for the June 2010 G-20 Summit Meeting, indicated that the World Trade Organization Agreement on Subsidies and Countervailing Measures (ACMS) provides a definition of subsidy that has been accepted by all WTO members. Article 1 of the Agreement states that a subsidy exists when there is a financial contribution by a government. The Agreement identifies financial contribution as when a government practice involves direct transfer of funds (examples, grants, loans, and equity infusion), potential direct transfers of funds or liabilities (example, loan guarantees). This typically means that a benefit is conferred when the financial contribution is provided to the recipient on terms that are more favorable than those that the recipient could have obtained from the market.

Subsidies arise for several reasons. Barany and Grignoyte (2015) found that in addition to the impact of subsidies on the price and quantity of fuels used, subsidies also have effects on the government, on employment, and on other factors of the economy. Barany and Grignoyte (2015) identified the main motivation for subsidizing fuels in most countries as a social one, as access to basic energy services raises the living standards of the poor.

Despite the advantages of subsidies, there is extensive evidence of the distortions subsidies create. Barany and Grignoyte (2015) identified that the main motivation for the phasing out of fossil fuel subsidies is that they are very costly to the taxpayers, crowd out high-priority government expenditure and do not necessarily benefit the target group. Citing Sab (2014), Barany and Grignoyte (2015) showed that in Egypt, the lowest income quintile captured only 1% of diesel consumption subsidies, while the richest 20% reaped over 70% of the benefits. In addition, Barany and Grignoyte (2015) pointed that fuel subsidies distort market price signals, and thus investment and consumption decisions, leading to an inefficient allocation of resources and lower economic growth in the long run.

As a result of the negative tendencies, a window of opportunity to reform fuel subsidies is provided. Barany and Grignoyte (2015) explained that carefully prepared fuel subsidies reforms could lead to more robust fiscal positions and contribute to potential growth through a reduction in economic distortions and the mitigation of climate change due to lower carbon dioxide emissions.

By estimation, it can be observed that Ghana's downstream petroleum sector deregulation is consistent with the theoretical framework.

1.7 Cognitive map

The researcher proposes two cognitive maps: the first shows the how stakeholders view the relationship between deregulation and its potential benefits to the Ghanaian economy; and the second is the ideal proposal of the researcher. The cognitive map

identifies with the available literature on the relationship between deregulation and institutions.

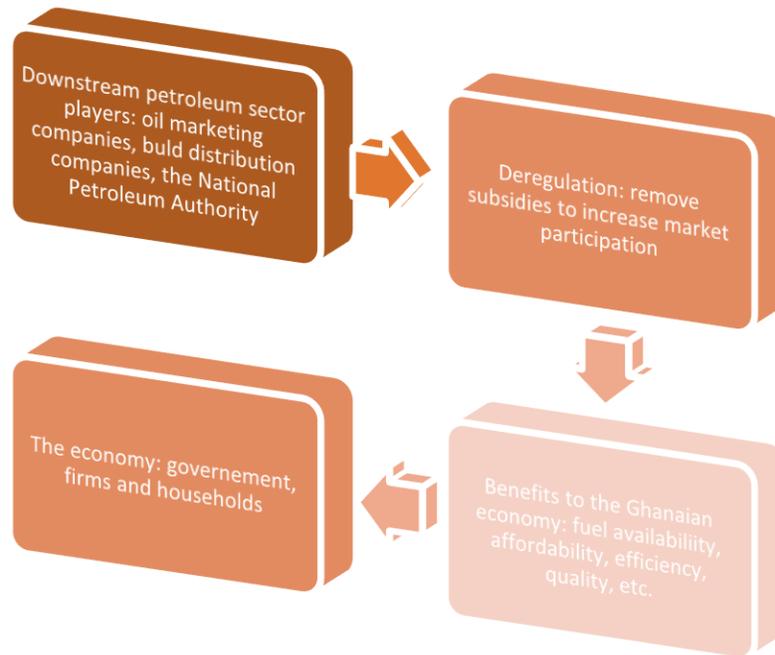


Diagram 1. 4 Stakeholders' proposal of the relationship between deregulation and its benefits

Source: Author's drawing

From the process flow chart above, it can be observed that with deregulation, the downstream petroleum sector would yield the benefits to the actors of the economy, government, firms, and the households. That is the expectations of stakeholders would be met with the mere implementation of the full deregulation policy. The underlying assumptions have limited provision for institutions. This renders the proposal ineffective, in the view of the researcher.

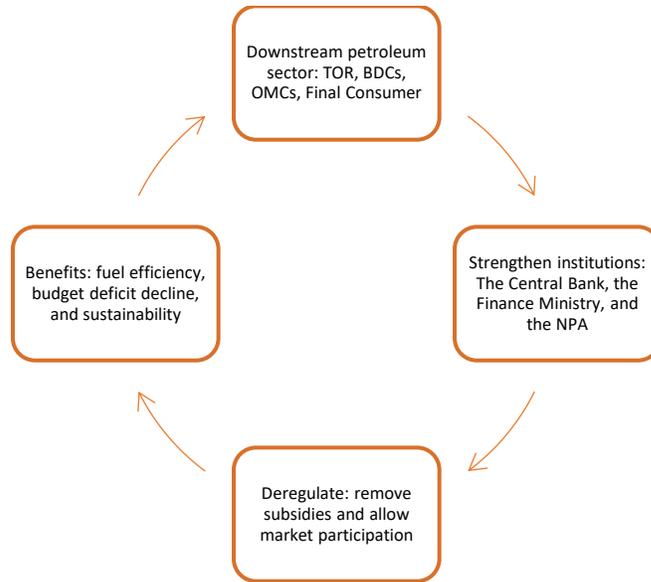


Diagram 1. 5 Ideal proposal of the relationship between deregulation and its benefits

Source: Author's drawing

Diagram 1.5 introduces institutions, and these institutions would structure incentives and allocation of resources in the economy. These institutions ensure justice, fair competition and compensations, and distortions in the market are corrected by the institutions.

1.8 Thesis outline

The thesis is organized into five main chapters and they are as observed below.

Chapter 1: Introduction, in part, presents the general idea of deregulation policies carried out in both advanced and developing countries. It also highlights the background, the problem statement, the research objectives, the research questions, hypothesis, the significance of the project, and the cognitive map.

Chapter 2: Literature review informs readers of the work done on deregulation, institutions and the downstream petroleum sector. It also captures the core messages of various schools of thought on deregulation and institutions on other sectors of economies in Africa. It especially talks about the allocation of subsidy on petroleum products, and how such subsidies are mistargeted.

Chapter 3: Methodology outlines data collection strategies employed to study the topic under review. This chapter addresses the methods followed to understand how Ghana could benefit from strengthening institutions. It focuses more on qualitative data collection strategies since the research involves responses from a cross section of downstream petroleum sector players, like the NPA, the Central Bank, and the Ministry of Finance.

Chapter 4: Findings and discussions addresses the results obtained from the methodology, and the findings are discussed.

Chapter 5: Conclusions and recommendations relies on the findings and discussions to make recommendations to policymakers on the deregulation policy.

Chapter 2: Literature review

2.0 Introduction

The literature review covers such areas as deregulation theories and their predictions on economic performance; implementation of deregulation policies in the international context; overview of subsidy allocation in the world; deregulation in the downstream

sector in developing countries; overview of deregulation and relevance of institutions; and the gap in the literature on deregulation.

2.1 Deregulation theories and their predictions on economic performance

The OECD (2005, p.114) defined a subsidy as “any measure that keeps prices for consumers below market levels, or for producers above market levels or that reduces costs for consumers or producers.” There are several types of subsidies such as fuel subsidies, food subsidies or energy subsidies depending on the target recipient of the subsidy. The IEA (2014, p.315) defined an energy subsidy as “any government action directed at the energy sector that lowers the cost of energy production, raises the price received by energy producers or lowers the price paid by energy consumers.” For example, according to the Appropriation Act 2015 (Act 901), 1st Schedule-Section 1 of the Appropriation Bill for the 2016 financial year, the Finance Ministry issued GHS 50,000,000.00 in subsidies on the petroleum products that are not deregulated. The purpose of this subsidy was to cushion consumers of such products.

Barany and Grignoyte (2015) pointed out that the concept of energy subsidy is regressive. Similarly, Coady (2006), Janvier et al (2010), Edgar et al (2014) and the IMF (2013) indicated that energy subsidies promote economic inefficiencies and distortions. Barany and Grignoyte (2015) further predicted that an effective deregulation would lead to more robust fiscal positions and contribute to potential growth through a reduction in economic distortions and the mitigation of climate change. Barany and Grignoyte (2015) suggest that a correct deregulation policy could reduce what is known as under-taxation

of fuels relative to economically optimal levels, which is also identified as another form of subsidy.

IMF (2013), therefore, emphasized that, when subsidies fail to achieve targets, an efficient market decision is to deregulate the sector, hence removing subsidies.

2.2 Implementation of deregulation policies in the international context

Deregulation has been practiced by several international economies. For example, Harker and Price (2006) pointed out that the government of England reformed the English energy sector in the late 1990s to allow market participation. Narrating the result of that reform, Stephen and James (2000) argued that the lack of consideration for market power undermined the goal of the deregulation policy, leading to a regulatory backlash.

2.2.1 How subsidies mistargets the poor in Ghana

Cooke, Cockburn, Hague, Lahga and Tiberti (2014) estimated that around 70% of the benefits from subsidies on gasoline in Africa reach the wealthiest quintile, while just 2.2% accrue to the poorest quintile, meaning that subsidies are regressive. Cooke et al (2014) found that even for those fuel products that are supposedly ‘pro-poor such as kerosene, on average, in Africa, just 16% of the subsidy benefits reach the poorest quintile. Cooke et al (2014) also found that the substantial leakage of subsidy benefits to the top income groups means that universal fuel subsidies are an extremely costly approach to protecting the welfare of poor households. This reflects the fact that over 97 out of every 100 dollars of gasoline subsidy “leaks” to the top four quintiles.

	Quintile				
	1 (Poorest)	2	3	4	5 (Richest)
Diesel	0.12	0.63	1.45	1.33	96.46
Petrol	0.90	1.35	1.62	3.35	92.78
LPG	0.16	0.69	2.17	11.43	85.55
Kerosene	10.69	13.88	18.06	20.96	36.42
Total	2.97	4.14	5.83	9.27	77.80

Table 2. 1 Benefit incidence of fuel subsidies accruing to each quintile (in %)

Source: Cooke et al (2014)

From Table 2.1, it is observed that about 85.55%, 92.8% and 96.5% of LPG, petrol and diesel subsidies, respectively, accrue to the richest quintile. However, the poorest quintile receives less than 1% of these subsidies. For kerosene, the poorest quintile receives 10.69% of the subsidy while the richest quintile receives 36.42%. Meanwhile, Table 2.3 below indicates the budget shares of the rich and poor in the Ghana on fuel product, expenditure per capita, subsidies per capita and household size for each quintile.

Budget Shares for Fuel (in %)						
	Q1	Q2	Q3	Q4	Q5	All
Diesel	0.00	0.01	0.07	0.02	0.35	0.09
Petrol	0.40	0.29	0.19	0.34	1.22	0.49
LPG	0.01	0.02	0.05	0.15	0.33	0.11
Kerosene	4.37	2.97	2.31	1.62	0.96	2.45
Total	4.79	3.29	2.62	2.12	2.87	3.14
Subsidy per Capita (GHS per year)						
Diesel	0.00	0.01	0.06	0.03	2.02	0.42
Petrol	0.17	0.21	0.19	0.51	7.32	1.68
LPG	0.01	0.04	0.17	0.71	3.12	0.81
Kerosene	2.05	2.74	3.14	3.11	3.40	2.89
Total	2.23	2.99	3.55	4.35	15.86	5.80
Household Size						
Household size	6.37	5.14	4.40	3.71	2.51	4.01
Expenditure per Capita (GHS per year)						
Expenditure per Capita	995.92	1550.96	2013.17	2604.33	4242.89	2280.90

Table 2. 2 Budget shares and per capita subsidy amount per quintile

Source: Cooke et al (2014)

From Table 2.2, as shown by Cooke et al (2014), the budget shares of fuel expenditure indicate that the poorest households spend less than 1% of their budget on petrol, diesel and LPG. However, they spend the largest share (4.4% of their total spending) of all the quintile groups on kerosene.

In contrast, the richest quintiles spend the largest share of their budget on diesel, petrol and LPG. Although more than a third of the kerosene subsidy accrues to the richest group, they spend the lowest share of their budget on kerosene, less than 1%. Thus the amount of the subsidy received per capita by quintile shows a similar pattern. For all fuels, the amount of subsidy received per capita is higher for the richest households- they receive GHS 2.02 per person per year for the diesel subsidy lone.

For petrol, the richest households receive almost forty-three times as much subsidy per capita than the poor- GHS 7.32 per year compared to just GHS 0.17 for the poorest

group. Even for kerosene, used so much more by the poor, the richest households receive GHS 3.40 per capita compared to the poor's GHS 2.05.

2.2.2 Subsidy and its effect on pollution

The question of whether subsidy reduction would influence pollution is well tackled by the literature. A study by the International Energy Agency (IEA, 1999) found that removing consumer subsidies in eight large non-OECD countries could cut their carbon dioxide emissions by up to 16%, which would reduce global carbon dioxide emissions by nearly 5%.

On the issue of welfare enhancement, Burniaux, Martin and Oliveira-Martins (1992) show the following.

1. The removal of energy subsidies to consumers in non-OECD countries would increase global welfare by \$35 billion.
2. Removing subsidies will lead to greater fairness, meaning that only people who consume a certain good or service pay for it and its affiliated environmental costs.
3. And a clear, undistorted pricing of goods and services improves economic efficiency and national welfare.

Furthermore, Parry (2014), referencing National Research Council (2009), State Environment Protection Agency of China (2007), World Bank and World Health Organization (2013), found that outdoor air pollution, primarily from fossil fuel combustion, causes more than 3 million premature deaths a year worldwide, costing about 1 percent of GDP for the United States and almost 4% for China.

Citing Parry and Small (2009) and World Health Organisation (2013), Parry (2014) observed that motor vehicle use leads to crowded roads, accidental death, and injuries. Drivers in the London rush hour, for example, impose estimated costs on others that are equivalent to about US \$10 per liter (\$38 per gallon) of the fuel they use through their contribution to traffic congestion, and traffic accidents cause an estimated 1.3 million deaths worldwide.

The above observations could be summarized in a resolution that was reached by the Asia-Pacific Economic Cooperation [APEC] (1999). Suggesting the need to ensure energy markets facilitate improvements in energy efficiency, environmental protection, and investment in supply infrastructure, APEC (1999) resolved that “the Energy Ministers consider reducing energy subsidies progressively and promote implementation of pricing practices which reflect the economic cost of supplying and using energy across the full energy cycle, having regard to environmental costs.”

2.2.3 Effects of subsidy removal on households and the economy

Anand, Coady, Mohammad, Thakoor and Walsh (2013) noted that subsidy removal affects households, both directly and indirectly. According to Anand et al (2013), typically, the bulk of petroleum is consumed indirectly through household consumption of other goods and services that use petroleum products as inputs. Therefore, the welfare effect of higher fuel prices—or, equivalently, lower fuel subsidies—on household real incomes will depend both on the direct effect of higher prices for petroleum products consumed by households and on the indirect effect arising from higher prices for other

goods and services consumed by households to the extent that higher petroleum costs are passed on to consumer prices.

2.3 Overview of subsidy allocation in the world

Stephan Barg (1996) argued that a subsidy is a government-directed, market distorting intervention which decreases the cost of producing a specific good or service or increases the price which may be charged for it. By this definition, it means that to correct such distortions introduced into the market, there is need to remove or modify the subsidy.

The definition above strongly stresses that subsidy is negative, and it is more evident in the studies done by scholars. Proving this phenomenon, Myers (1998) estimated annual global energy subsidies to be \$145 billion, of which \$ 110 billion are perverse subsidies. Some of this amount is indirect, yet the literature posits that they are economically inefficient. For example, Fischer and Toman (1998) pointed out that indirect subsidies, which mandate or protect certain technologies, are almost always a less efficient policy option compared to policies that penalize polluters, for example, through internalization of external costs.

Bruce (1990) and Myers (1998) documented the following.

1. Energy subsidies, for example, aggravate governments' budget deficits and divert government funds from other programs with possibly higher benefits to the society.
2. Subsidies produce economic efficiency costs, because resources are allocated so as to take advantage of subsidies rather than market

profitability.

3. Subsidies produce equity costs, because they tend to benefit few at the expense of many.
4. And most energy subsidies are harmful to the environment, because they support polluting energy technologies, or they encourage increased energy consumption.

2.3.1 Deregulated industries in Africa

Attention is now drawn to the evidence of the effectiveness of deregulation in certain key industries, like the forex exchange market (FOREX), agriculture, the financial sector, the telecommunications sector, and others in Africa.

In the foreign exchange sector, Odubogun (1995) observed that a market determined allocation of foreign exchange and the exchange rate is considered necessary to an improvement in the competitiveness of the Nigerian economy both internally and in its trade and financial transactions with the rest of the world. Odubogun (1995) further hinted that the realization of the advantages of the market by an economy depended on the functional character of its markets and its public institutions. In a striking observation, Odubogun (1995) revealed that there was evidence that in spite of the market reform in 1986, the naira exchange rate was still not competitively determined and allocation of FOREX remains inconsistent with the requirement for the long-term development of the Nigerian economy.

The case of cashew production in Tanzania seems apparent in recognizing that deregulation in that sector is incomplete. A case study of the sector by Mwase (1998)

recommended that “even though the state had withdrawn from active involvement in cashew production and marketing, it could facilitate these activities by removing remaining constraints to private sector entry; encouraging formation of small-scale seed companies by “progressive farmers” or the informal sector; removing remaining restrictions to getting cashew input permits; publicizing and encouraging private trader procurement and sale of cashew inputs and outputs; and establishing a comprehensive market information system available to all players.”

2.3.2 Empirical reasons for deregulation in Africa

In general, economies are deregulated to respond to some perceived distortions that are experienced regulated economies, as seen in the above analysis. More specifically, the history of deregulation in Africa seems to have been dictated, in part, by external influence other than the market forces of demand and supply.

Afeikhena (2002) argued that privatization gained considerable momentum in developing countries given its endorsement by the multinational financial institutions as a major plank of adjustment policies. Narrating the reform in the telecommunications industry in Nigeria, Afeikhena (2002) indicated that the resort to privatization was informed by several considerations.

First, by 1985, the quantum of resources required to sustain the State Owned Enterprises (SOEs) had become an unbearable burden on the affected nations.

Second, Jerome (2002) pointed out that since the beginning of the 1980s, privatization of public enterprises has become a major policy tool in both developed and developing countries following the apparently successful programmer in Britain.

Jerome (2002) agreed with the conventional thought that the urge for privatization was reinforced by the need to reduce government expenditure in the face of burgeoning fiscal deficits, and was also in conformity with the resurgence of ‘economic liberalism’ in the development literature.

The literature on Ghana’s savings from removing subsidy in the past few years is revealing. Cooke et al (2014) showed that in 2013, the Ghanaian Government would have spent GHS 2.4 billion on fuel subsidies, equaling 3.2% of GDP and more than half of Ghana’s allocation to the entire education sector, and that was at a time when the 2012 budget deficit was near 12%.

In a related study, Anand et al (2013) observed that subsidy reduction assists governments to increase investments in other sectors. The study revealed that it is important to emphasize that the budgetary savings from reducing fuel subsidies can be used to increase expenditures in areas that are typically seen as having higher priority, example, increasing access to or the quality of education and health services or physical infrastructure, or used to reduce taxes.

[2.4 Deregulation in the downstream sector in developing countries](#)

This session studies the literature on deregulation in the downstream sector in developing countries, which includes the effects of rising fuel prices on oil importing economies, and the currency performance, inflation and deregulation.

2.4.1 Effect of rising fuel prices on oil importing economies

Rising oil prices tend to affect not only households and real incomes, it also affects the economy as a whole. The following are identified as the effects of rising oil prices on mostly oil importing economies, of which Ghana is a member.

The results of a model estimations developed by the African Development Bank (2009) suggest that high oil prices can have very harmful effects on the economies of African oil-importing countries, especially those that are heavily debt-burdened. The rising oil prices will lead to a decrease in output and consumption, and to a worsening of the net foreign asset position.

African Development Bank (2009), citing Dohner (1981), pointed out that a rise in oil prices leads to deterioration in the terms of trade of net oil-importing countries, and, subsequently, to a fall in the purchasing power of firms and households in net oil-importing countries.

Similarly, citing Loungani (1986), African Development Bank (2009) revealed that if oil price increases prevail over a long period, they may lead to a change in the production structure in favor of non-oil intensive sectors, which may lead to other distortions.

Figure 2.1 below illustrates the behavior of international crude oil prices from 1995-2013. The figure shows a rising oil price, despite the dip in the price in the first quarter of 2009. Overall it is observed from Fig 3 that fuel prices have been climbing since 1995. It plummeted from over \$100 per barrel to less than \$50 per barrel in 2010. Crude oil prices reached US\$59.82 a barrel in June 2015 and fell further to US\$42.46 a barrel in September 2015 (Ministry of Finance, 2015).

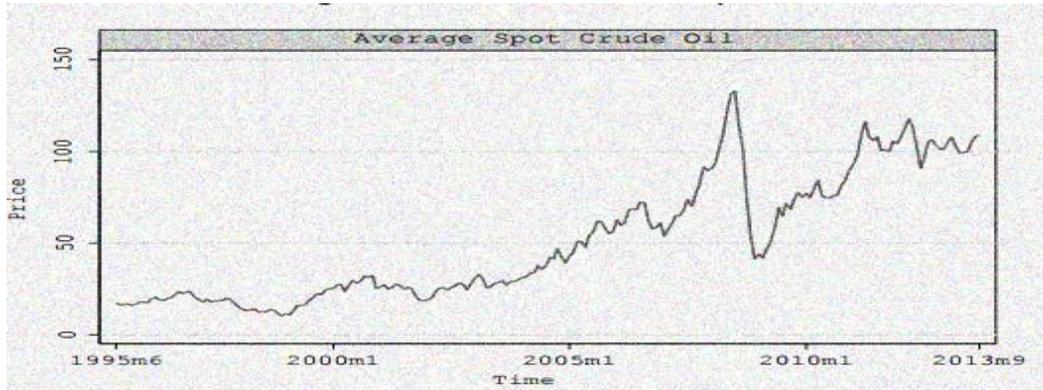


Figure 2. 1 International crude oil prices from 1995 to 2013

Source: UNICEF, 2014.

2.4.2 National currency performance and deregulation

Identifying that a strong currency is good for economies during oil price increase, African Development Bank (2009) indicated that although in some countries oil price increases may have been partly offset by exchange rate movements (notably the weakening of the U.S. dollar against the euro), it has also had major socioeconomic impacts. These results indicate that, in part, rising oil prices under deregulation may not require the reintroduction of subsidy if the currency movement is positive.

According to Loloh (2014), one macroeconomic variable that is known from monetary policy perspective to underpin the behavior of domestic prices is exchange rate. Referencing Warjiyo (2013), Loloh (2014) indicates that small open economies like Ghana have a particularly peculiar problem because the exchange rate movement may not reflect the economic fundamentals due to several factors.

Taylor (2000) shows that the inflationary regime of a country could determine the pass-through effect monetary shocks on domestic prices. Similarly, Choudhri and Hakura

(2001) found that there is strong evidence of a positive and significant association between the pass-through and the average inflation rate across countries and periods. While Loloh (2014) showed that the conventional wisdom of exchange rate pass-through to domestic prices is always highest in “emerging” than in “developed” countries, Hahn, Sanchez and Zorzi (2007) overturned the conventional wisdom, based on their three alternative vector auto regression models. Hahn et al (2007) asserted that for emerging markets with only single digit inflation, pass-through to import and consumer prices is found to be low and not very dissimilar from the levels of developed economies.

2.5 Taxation of petroleum products and deregulation

Fuel taxation is another major factor in energy pricing, which is central to the definition of energy subsidies and is relevant in the case of Ghana.

Coady, Parry, Sears and Shang (2015) suggested that the efficient consumer price for an energy product consists of three tax components: the cost of supplying the product to the consumer (or opportunity cost), a “Pigouvian” (or “corrective”) tax reflecting the environmental costs (or externalities) associated with energy consumption, and (less important) a consumption tax reflecting the need to tax all consumption to raise revenue..

In fact, Coady et al (2010) realized that given that energy demand is inelastic and that there are negative consumption externalities associated with its use, taxation of petroleum products is generally regarded as an efficient way to raise government revenue. According to the Ramsey Rule for efficient commodity taxation proposed by Ramsey (1927), tax levels across commodities should be inversely proportional to their price elasticity of demand in order to minimize the distortion in consumption. In a related

study, Crawford et al (2008) extended this theory to suggest that to the extent that petroleum consumption is relatively inelastic, taxes should be higher on petroleum products. However, Stiglitz (2015) proposes that a careful application of Ramsey's (1927) analysis to developing countries must consider the following.

1. The constraints on taxation
2. The elasticities of demand and supply
3. And the structure of the economy.

Stiglitz (2015) submitted that Ramsey's (1927) analysis assumes perfectly competitive markets.

The tax policy may be negative, as indicated by Coady et al (2010), suggesting that second-best considerations may dilute the argument for relatively high taxation of commercial energy. For example, Coady et al (2010) proposed that high energy prices may encourage rural households to switch to the use of already overexploited natural resources such as fuel wood. Therefore, African Development Bank (2009) suggested that high oil prices could be curbed by reducing taxes on the oil products. In many European countries, which have high taxes on fuels, such price shocks could potentially be mitigated by reducing the taxes as fuel costs rise, as reported by African Development Bank (2009).

In many African countries, on the contrary, Parry (2014) observed that this option is not feasible, as there is, in some cases, limited taxation on oil products in the first place. In the case of countries like Ghana, fuel taxation may be a major source of government revenue as the informal sector is so large that the government gets significant tax revenue

from indirect rather than direct taxation. Parry (2014) found that energy prices in many countries may be wrong in the sense that they do not reflect market fundamentals nor recognize externalities. As a result, Parry (2014) suggested the following taxes on fuel products.

1. A tax charge on fossil fuels in proportion to their CO₂ emissions multiplied by the global damage from those emissions.
2. Additional charge on fuels used in power generation, heating, and by other stationary sources in proportion to the local air pollution emissions from these fuels but with credits for demonstrated emissions capture during fuel combustion, given that net emissions released are what determine environmental damage.
3. And an additional tax for local pollution, congestion, accidents, and pavement damage attributable to motor vehicles.

2.5.1 Price adjustment challenges prior to full deregulation in Ghana

The administration of the publicly released price-adjustment formula was transferred to the newly established National Petroleum Agency (NPA), according to IMF (2013). According to IMF (2013), the delegation of regulatory powers to the NPA was meant to isolate the decision to adjust prices from political intervention. In the wake of the 2007–08 global fuel and food crisis and in the run-up to the 2008 elections, however, automatic adjustment was temporarily suspended. Similar suspensions have been observed over the past two decades, as can be found in Fig 2.2 below, as reported by IMF (2013).

The 2005 reforms ushered in a period of market-based fuel pricing. However, political considerations have at times interfered with this process.

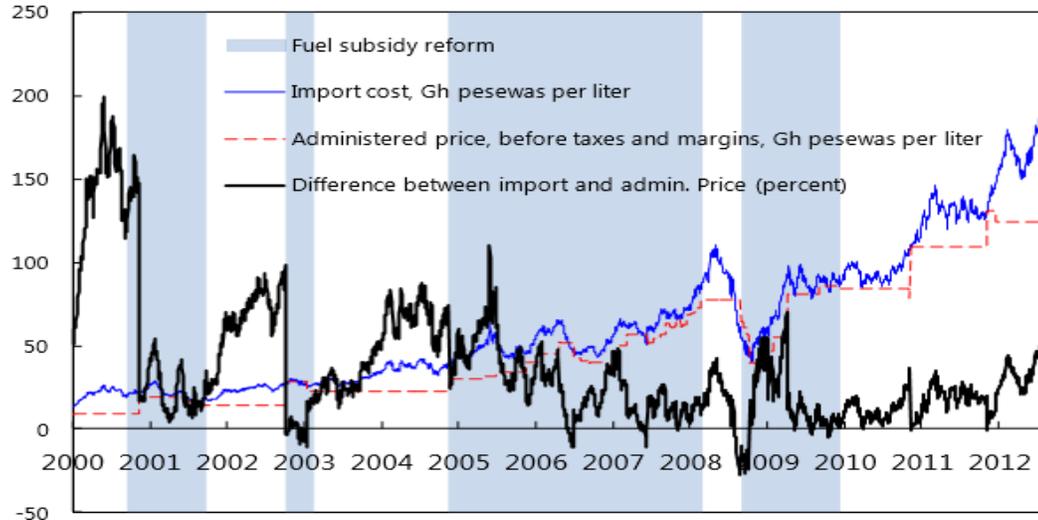


Figure 2. 2 Ghana: Fuel price developments, 2000-2012

Source: National Petroleum Authority, and IMF staff estimates (2013)

Fig 2.2 indicates that subsidy reforms are suspended mostly in election years even in the face of rising import costs, as can be observed in years 2004 and 2008.

The IMF (2013) referencing (IMF, 2012a, b) pointed out that the NPA remained the main regulatory agency and published the price adjustments required for cost recovery on a biweekly basis. When an upward price adjustment had been required in recent years, the shortfall had often been covered by the budget or more recently by hedging profits. This had resulted in infrequent and large price adjustments, when hedging profits were exhausted and the fiscal burden became too onerous. Prices were adjusted twice in 2011, by 30 percent in January and 15 percent in December. Prices had not been adjusted in 2012 (with the exception of a small downward adjustment early in

the year) and the gap between domestic and global oil prices, exacerbated by a depreciating currency, has increased substantially.

The recent full deregulation policy has seen OMCs setting their own prices (Joy Online, 2015). Fig 2.3 and Table 2.3 below display ten OMCs and their quoted prices for both Petrol and Diesel.

COPEC GH/OMC BEST PRICES CHART AS AT 5TH NOVEMBER 2015					
Position	Oil Marketing Company	Petrol		Diesel	
		Price per Litre(Ghs)	Price per Gallon(Ghs)	Price per Litre (Ghs)	Price per Gallon(Ghs)
1st	Allied Oil	2.663	11.98	2.565	11.54
2nd	Petrobay	2.670	12.02	2.650	11.93
3rd	Star Oil	2.671	12.02	2.669	12.01
4th	Goil	2.673	12.03	2.666	12.00
5th	Total Ghana	2.673	12.03	2.666	12.00
6th	Shell Ghana	2.673	12.03	2.666	12.00
7th	Petrosol	2.737	12.32	2.729	12.28
8th	Glory Oil	2.760	12.42	2.670	12.02
9th	Frimps Oil	2.771	12.47	2.700	12.15
10th	SO Energy	2.800	12.60	2.723	12.25

Table 2. 3 Ten oil marketing companies and their quoted prices for petrol and diesel

Source: Chamber of Petroleum Consumers Ghana (2015)

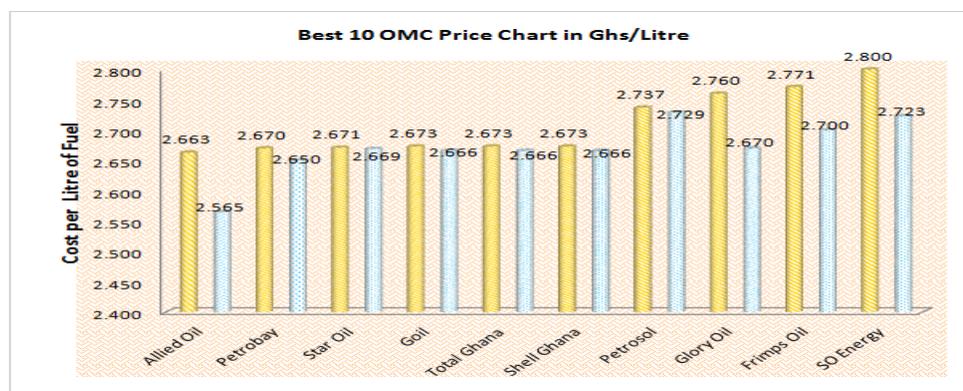


Figure 2. 3 Best ten oil marketing companies and their quoted prices for petrol and diesel

Source: Chamber of Petroleum Consumers Ghana (2015).

Both Table 2.3 and Fig 2.3 indicate that Allied Oil quoted the lowest price for Petrol and Diesel while SO Energy quoted the highest price for both products. That suggests that OMCs are now attracting consumers with their prices and marketing strategies because of the competition in the industry.

2.6 Overview of deregulation and relevance of institutions

North (1990, p.3) defined institutions as the rules of the game in a society or, more formally, are the humanly devised constraints that shape human interaction. North (1990) further indicated that institutions structure incentives in human exchange, whether political, social, or economic.

Similarly, Acemoglu and Johnson (2004) reiterated and revalidated the roles that institutions play in development, by clearly specifying the characteristics of weak institutions to include the following:

1. Unfettered power conferred on the leadership of the country or the executive
2. Weak enforcement of the rule of law
3. Weak enforcement of property rights
4. Ineffective land tenure system
5. Lack of equality of opportunities for majority of the population.

For the purpose of this research, emphasis is placed on the unfettered power of the executive, which is the strength of political institutions. This is because North (1990) indicates that political institutions determine economic institutions and economic

performance both directly and indirectly. For their direct effect, he asserts that if political institutions place all political power in the hands of the a single individual or a small group, economic institutions that provide protection of property rights and equal opportunity for the rest of the population are difficult to sustain. This effect is exactly what Ghana faces: the 1992 Constitution of Ghana permits the President to appoint the head and other sensitive officers of all institutions like the Bank of Ghana, the National Petroleum Authority, Tema Oil Refinery, and other critical institutions. It is not surprising that the Bank of Ghana struggles to ensure a stable and sound monetary policy, resulting from its regular financing of government deficit.

Appendix 1 below illustrates some of the strategies employed by Ghana to protect the poor as a contrast to subsidies that do not reach the vulnerable (Edgar F.A. Cook, 2014). From Appendix 1, it can be observed that potentially well targeted programs include the Livelihood Empowerment Against Poverty (LEAP), the National Health Insurance Scheme (NHIS) and Free School uniforms for primary schools in poor areas.

Some scholars have strongly advocated for the complete removal of the government from the market even in the face of market failure, while others recommend gradual removal of the government. For instance, Stiglitz (1989) profoundly asserts that the fact that markets face certain problems does not in itself justify government intervention; it only identifies the potential areas for it. The government is likely to face similar [imperfect information] problems if it intervenes. However, Atingi-Ego (2003) disagrees, positing that financial liberalization requires as a pre-condition that fiscal

discipline on the part of Government prevails.

2.7 The gap in the literature on deregulation

The strand of literature on deregulation also focuses on the reform needed to bring about economic progress after deregulation. However, a careful scrutiny of the literature reveals that there is insufficient clarity on the role of financial institutions on a deregulated sector, for instance. More specifically, it is observed that the deregulation observed in Britain was successful (Jerome, 2002). But the unanswered question is, how critical was the British currency to the deregulation? Much of the studies focused on the sector that was deregulated, with little emphasis on the role of currency and taxation on the deregulation, for example.

In the case of Ghana, it is thus critical to analyze how the performance of the Cedi is critical to the success of the downstream full petroleum sector deregulation, for example. This is because with a rapidly depreciating Cedi, for example, Ghanaians would still purchase fuel at higher prices if the world price of fuel drops, which is a distortion. On the other hand, higher taxes on the petroleum products for the purposes of meeting other commitments, could make the energy reform ineffective.

Though Thomas Klitgaard and Rekha Reddy (2000) hinted on the relationship between a deregulated electricity sector in California and the financial sector, their research was too narrow to be relied on for sufficient understanding.

In conclusion, the available literature written by IMF (2013) and Cook et al (2014) proposes strategies to curb the adverse effects of subsidy reform on the poor, forever. However, the literature does not tackle how the cause of the negative effects. As

such the literature is silent on the role of institutions on a deregulated sector. This thesis fills the gap in the literature.

Chapter 3: Methodology

3.1 Overview of Methodology

This part of the research focuses on the methods employed to undertake the research. This also includes the instruments used in the information gathering process. The methodology describes the population and procedures used in exploring the benefits of strengthening institutions to the economy of Ghana. The research design is shown below.

3.2 Research Design

For any investigation, the selection of an appropriate research design is crucial in enabling one to arrive at valid findings, comparisons and conclusions (Ranjit, 2011).

Ranjit (2011) emphasizes that the strength of an empirical investigation is primarily evaluated in the light of the research design. Research design may, therefore, refer to the structure of an enquiry.

According to Maree (2007), a research is a plan that moves from the underlying philosophical assumptions to specifying the selection of respondents, the data gathering techniques to be used and the data analysis to be done.

Similarly, Taylor (2000) defines research designs as constructed plans or strategies that are developed to seek and discover answers to research questions. The

purpose of this research design is to minimize the tendency to draw incorrect causal interferences from data collected.

There are two kinds of research approaches: quantitative research and qualitative research. This study, however, is qualitative in its approach. Qualitative research usually aids the researcher to obtain an in-depth understanding of events. Thus the study employs qualitative techniques because it seeks to gain understanding of the deregulation exercise in the downstream petroleum sector (Key, 1997).

It is also important to mention that qualitative research is preferred to quantitative research in this context because quantitative research seeks to find a precise or exact measurement while qualitative research is subjective, using the researcher's interpretation of results. Relying on this logic, the research follows the case study design approach. According to Leedy (1993) and Anderson (1993), the case study design deals with contemporary events and is concerned with how and why things happen.

The main advantage of the case study is its ability to probe deeply, analyze intensively and get an in-depth and detailed understanding of the phenomenon under review (Cohen and Manion, 1994; Cohen, Manion & Morrison, 2006; Creswell, 2007; Denscombe, 2001; and Wimmer and Mace, 2007). This justifies the research design.

Even though critics argue that the case study approach lacks internal reliability as another researcher might come to a differing conclusion (Anderson, 1993), the incorporation of multiple data sources in the study such as individual interviews, focus group discussions, observations, and documentary analysis improves internal reliability

since conclusions suggested by different data sources are far stronger than those suggested by one source (Tichapondwa, 2013).

3.3 Research scope

This research focuses on Ghana’s downstream petroleum sector deregulation exercise. The population and study area are explained in the next session.

3.3.1 Study population

The population of the study will consist mainly of individuals in the downstream petroleum sector who have in-depth understanding of the deregulation policy. The individuals in this sector together with those who work in the target institutions are selected because they understand the dynamics of the industry, and they play critical roles in the sector.

3.3.2 Study area

The Ghana’s petroleum downstream sector is selected for this study because it is the sector on which the policy has the most immediate effect.

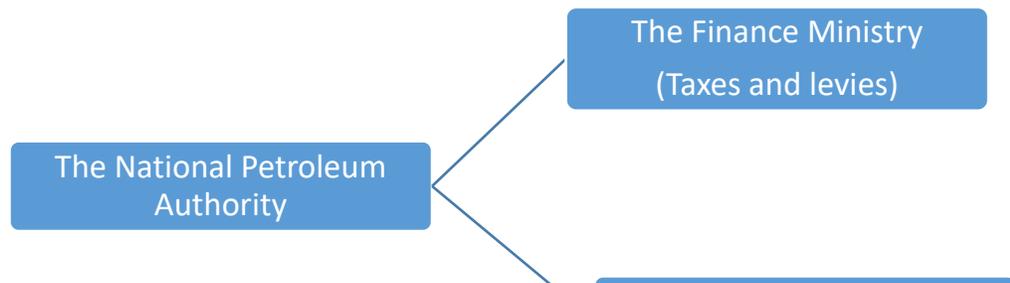


Diagram 3.1 Interactions between the three major national institutions in the petroleum downstream sector

Source: Researcher's drawing

Diagram six shows that, to set indicative ex-pump prices, for example, the NPA considers taxes, levies, margins, and the exchange rate.

3.4 Sampling Strategy

Different qualitative sampling strategies may be considered at different stages, and this is informed by questions regarding the research objectives, target population, sample techniques, and sample size.

3.4.1 Sampling techniques

Purposive sampling method is selected for this research because of the knowledge and expertise of the respondents making them suitable for the study (Sarantakos, 2005). This method allows the researcher to choose respondents who are relevant to the research. It is appropriate because it is complex collecting information from all subjects who comprise the total population. That means that this method helps to eliminate those who do not meet the requirements of the study. The drawback to this method is its subjectivity, making the researcher choose being convenient or objective. It also creates bias because it makes the researcher select certain individual respondents within the quotas (Sarantakos, 2005).

3.4.2 Sample size

According to Ranjit (2011), qualitative research data is usually collected to a point where one is not getting new information or it is negligible- the data saturation point. This stage determines the sample size. Therefore, the sample size preferred by the

researcher is seven (7) individuals from seven institutions who have appreciable knowledge in the deregulation policy. This requires sound selection of the respondents who will be ready and available to allow in-depth data and collection.

3.5 Data collection

The data to be collected will be from primary sources, with little support from secondary sources. Primary data will be collected from officials of the Finance Ministry, Central Bank, NPA, ACEP, Imani Ghana, and some prominent economists in Ghana. The secondary data will be collected from websites of key industry players, particularly the Central Bank.

3.5.1 Data collection instruments

The appropriate instruments for this research include interviews and analyses of documents. Tichapondwa (2010) citing Borg and Gall (1996) and Denscombe (2001) pointed out that interviews involve the collection of data through direct contact between the researcher and the respondents presumed to have certain experiences that enhance in-depth understanding of the problem under investigation.

Tichapondwa (2010), citing Patton (1990), argued that the purpose of interviewing is to find out what is in someone's mind and to depict the respondent's perceptions and experiences about a phenomenon under review.

Some advantages of semi-structured interview include flexibility, adaptability, and provision of direct human interaction that enables the researcher to probe and clarify answers with the respondents, follow-up leads, elaborate on original response and obtain

more data with greater detail and clarity, as Tichapondwa (2010) revealed from Borg and Gall (1996), Creswell (2007), Nachmias & Nachmias (1998) and Schurick (1990). The disadvantage is that this method is costly relative to questionnaires, and this promotes subjectivity and possible bias emanating from the eagerness to please the interviewer or the tendency by the interviewer to seek out answers that support their preconceived notions Tichapondwa (2010).

3.5.2 Data collection procedure

Responses from respondents were recorded using phones and notes were taken for emphasizes. Follow up was made on those respondents for clarifications. This also involved exchange of emails.

It is important to mention that respondents were provided a consent form, in order to adhere to the appropriate research ethics.

3.5.3 Data preparation, collation and processing

The research employed diagrams, figures and tables to prepare and process the data to be received from the research. For data collation, this research involved the use of electronic devices and recording materials. The objective was to ensure data integrity.

3.6 Data analysis

In data analysis, discussion and descriptive methods were used. Tables and charts were employed to serve as additional tools to summarize the data. This is expected to aid interpretation and understanding of the analysis.

3.7 Validity and reliability

Ranjit (2011) emphasized that validity in the broader sense refers to the ability of a research instrument to demonstrate that it is finding out what the researcher designed it to. Reliability, on the other hand, refers to the consistency in its findings when used repeatedly (Ranjit, 2011).

According to Ranjit (2011), Denzin and Lincoln (1994) provided a framework of four criteria as part of the constructivism paradigm paralleling “validity” and “reliability” in quantitative research. There are two set of criteria “for judging the goodness or quality of an inquiry in constructivism paradigm” (Denzin and Lincoln, 1994). These are trustworthiness and authenticity. Denzin and Lincoln (1994) revealed that trustworthiness in qualitative study is determined by four indicators- credibility, transferability, dependability and confirmability- and it is these four indicators that reflect validity and reliability in qualitative research. Ranjit (2011), citing Trochim and Donnelly (2007), compared the criteria proposed by Guba and Lincoln in the following table with validity and reliability as defined in quantitative research:

Traditional criteria for judging quantitative research	Alternative criteria for judging qualitative research
Internal Validity	Credibility
External Validity	Transferability
Reliability	Dependability
Objectivity	Confirmability

(Trochim and Donnelly 2007: 149)

According to Trochim and Donnelly (2007), credibility involves establishing that the results of qualitative research are credible from the perspective of the participant in the research. Transferability refers to the degree to which the results of qualitative research can be generalized to other contexts or settings; dependability is concerned with whether one would obtain the same results if the researcher could observe the same thing twice; and confirmability refers to the degree to which the results could be confirmed by others (Trochim and Donnelly, 2007).

Therefore, these four indicators guided the methodology to promote validity and reliability.

3.8 Ethical considerations

The following ethical issues were considered in the highest standards. This included ethical issues with respect to the participants: data collection practices, consent seeking, incentive provisions, seeking sensitive information, possibility of causing harm to participants, and maintaining confidentiality. Incentive provision was treated according to practices prescribed by Ashesi University College. Ethical issues concerning the researcher was also be respected: avoiding bias, using appropriate research methodology, correct reporting, and appropriate use of information received from respondents.

3.9 Limitations and delimitations

The limitations of this study were largely experienced in the data collection stage. The market is driven by profit making individuals. This incentive may have influenced

how much data the Association of Oil Marketing Companies volunteered, for example. That will be an issue of honesty.

Second, the full deregulation exercise in Ghana is just about ten (10) months since the market was deregulated. This short time period made it difficult to ascertain the success of the deregulation exercise.

Again, little consideration was given to household consumers, industries that rely on petroleum products, and others that are not policymakers. This is because the aim of the research is to focus on the policy directions of the deregulation exercise, which would yield the expected gains by the market. Again, little consideration is given to the effect of world price of fuel. This is essentially because, in the short term, Ghana has little to do to influence the world fuel price.

Further, I prepare to accept a reasonable delay in the collection of the response. People were usually reluctant to offer information that were needed within a short time.

Nevertheless, the researcher was determined to be resilient in committing efforts in the data collection process. The researcher also did extensive studies to gather sufficient data online to supplement the study.

Chapter 4: Findings and Discussion

4.0 Introduction

The analysis of the responses from the different respondents, including National Petroleum Authority, Africa Centre for Energy Policy, Association of Oil Marketing

Companies, Imani Ghana, and the Institute of Economic Affairs, the petroleum downstream industry revealed that the petroleum downstream petroleum sector is progressively competitive due to the deregulation exercise. The competition is most intense amongst the Oil Marketing Companies (OMCs) and Liquefied Petroleum Marketing Companies (LPGMCs), since there are about 3100 OMC/LPGMC outlets in the industry. The specific findings and discussions presented below follow the order of the research questions.

4.1 The strategic position of the NPA

The first research objective is to investigate the strategic position of the National Petroleum Authority with the aim of finding institutional challenges facing the regulator. The following are the evidence supporting the strategic position of the NPA.

The findings indicate that after full price liberalization, the role of the National Petroleum Authority's (NPA's) role has shifted from setting of the prices of petroleum products to monitoring and ensuring that Petroleum Service Providers (PSPs) set prices in accordance with the Prescribed Petroleum Pricing Formula.

The NPA, however, continues to set the prices for Premix Fuel, Residual Fuel Oil (RFO), Aviation Turbine Kerosene (ATK), Marine gasoil for foreign vessels, Gasoil for the Mines and the Rig. This indicates that the government is still interfering in the market for those particular products.

The NPA monitors quality by the application of the Petroleum Product Marking Scheme (PPMS), which involves the introduction of a bio-chemical liquid into the

petroleum product at the loading depots prior to delivery of products to the retail outlet. The results show that the PPMS is applied twice: it is first applied at the point of arrival of the products at the port, and the depots before the OMCs load the products for delivery.

The findings revealed that the NPA has implemented the Unified Petroleum Pricing Fund (UPPF) scheme that ensures there is regular supply of products to all parts of the country irrespective of geographical location. This UPPF has an element that represents as near as possible the actual cost of distribution. Further to this, the UPPF sees to it that petroleum products are efficiently transported throughout the country in a manner that is simple, effective and inexpensive to operate.

Regarding the monitoring of prices by the NPA, the OMCs/LPGMCs and BDCs set and submit their indicative ex-pump prices and ex-refinery prices two days before every two weeks-the pricing window- which are then examined and approved by the NPA. To set such prices, they follow the Prescribed Petroleum Pricing Formula which is shown in Appendix 2 and Appendix 3. Appendix 2 shows how the BDCs and refineries calculate their price, which is then taken by the OMCs. For example, to calculate the ex-refinery prices, the BDCs consider the price of crude, the freight on board prices, foreign exchange rates, and taxes. After determining their prices of the imported products, the various OMCs accept the ex-refinery prices set by their BDCs, and that informs their pricing strategies by considering the various taxes, levies, and margins. This is shown in Appendix 3.

According to the NPA, it has taken necessary measures to prevent the formation of cartels, monopolies and unfair competition. Mechanisms that allow OMCs to secure guarantees from reputable banks that will pay their bills when they default in the paying the BDCs have been put in place by the NPA. There is also complaints settlement committee put in place by the NPA. These measures are intended to improve competition in supply, production, and distribution of products.

To monitor prices set by OMCs, the Authority continues to ensure that OMCs and BDCs do not take undue advantage of consumers, by ensuring that they set their prices in accordance with the Prescribed Petroleum Pricing Formula. By this, the NPA ensures that ex-prices of an OMC or LPGMC must remain the same at all its retail outlets throughout the country within any particular period, avoiding variation of ex-pump prices across the country.

The NPA also monitors the stocks of petroleum products on a regular basis, and plans the importation of petroleum products to avoid shortage of petroleum products on the market.

In a related development, the Parliament of Ghana has passed the National Petroleum Authority Act 2015 (Act 691). The passage of the Act has settled the legal battle threatened against it by certain persons in Ghana, including the Minority Members of Parliament. That legal battle was to force the reversal of the deregulation exercise since the NPA was legally tasked by National Petroleum Act, 2005 (Act 691) to set

petroleum products and not the market players. As a result, the amendment has increased the sustainability of the deregulation policy because of the rise in confidence in the deregulation exercise. This is because the amendment has ensured that the National Petroleum Authority Act, 2005 (Act 691) is aligned with the full deregulation of the downstream sector.

4.1.1 The deregulation policy on the performance of the OMCs

It is observed that the OMCs now set their own ex-pump prices according to the Prescribed Petroleum Pricing Formula and ensure that all the retail outlets under their sponsorship sell petroleum products at their set prices. Each OMC now is allowed to set its own marketers' and dealers' margins.

According to the NPA, as at September 2015, there were 139 OMCs operating in the petroleum downstream sector. Using 2015 data to find the concentration of the 139 member OMCs market after the deregulation, the Herfindahl-Hirschman Index for the top four firms (Ghana Oil Company Limited, Shell, Total Petroleum Ghana Limited, and Star Oil Company Limited) is 0.06, which suggests the market is highly competitive.

Figure 4.1 below shows the nine major OMCs with market shares of more than 1% each as at September 201. Ghana Oil Company Limited (GOIL) was the market leader with 15% of the market share.

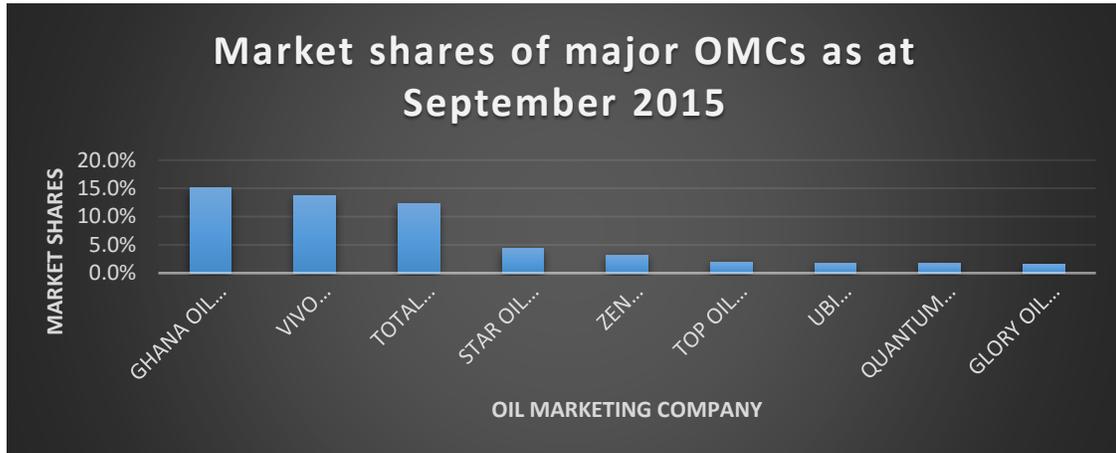


Figure 4. 1 Market shares of major OMCs as at September 2015

Source: NPA and author's drawing

Meanwhile, using 2014 data to find the concentration of the top four firms (Shell, Ghana Oil Company Limited, Total, and Star Oil Company Limited) prior to full deregulation, the Herfindahl-Hirschman Index is 0.054, which indicates a higher competitiveness relative to the 2015 Index. Figure 4.2 below shows the major OMCs as at December 2014, where Vivo Energy was the market leader with 14%.

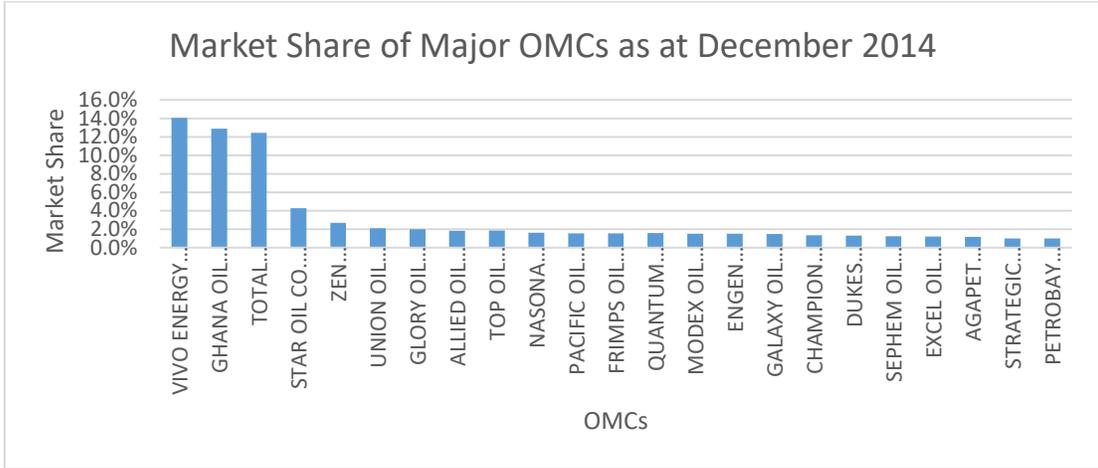


Figure 4. 2 Market shares of major OMCs as at December 2014

Source: NPA and author’s drawing

Similarly, Figure 4.3 below shows the major OMCs as at December 2013, where Total Petroleum was the market leader with 14%.

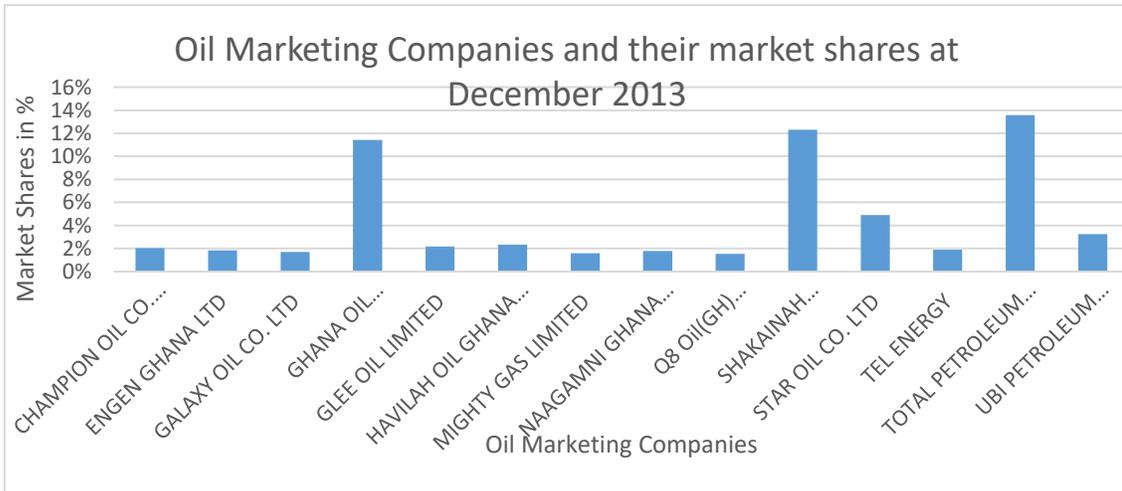


Figure 4. 3 Oil marketing companies and their market shares as at December 2013

Source: NPA and author's drawing

As at the end of 2013, the Herfindahl-Hirschman Index for the top four firms (Total Petroleum Company Limited, Shell, Ghana Oil Company Limited, and Star Oil) stood at 0.049. That indicated a higher competitiveness relative that of 2014.

4.1.2 The deregulation policy on the performance of the BDCs

The results also indicate that as at September 2015, of the 30 BDCs licensed by the NPA, GO Energy Company Limited was the market leader with 17.49% market share.

This can be seen in Figure 4.4 below.

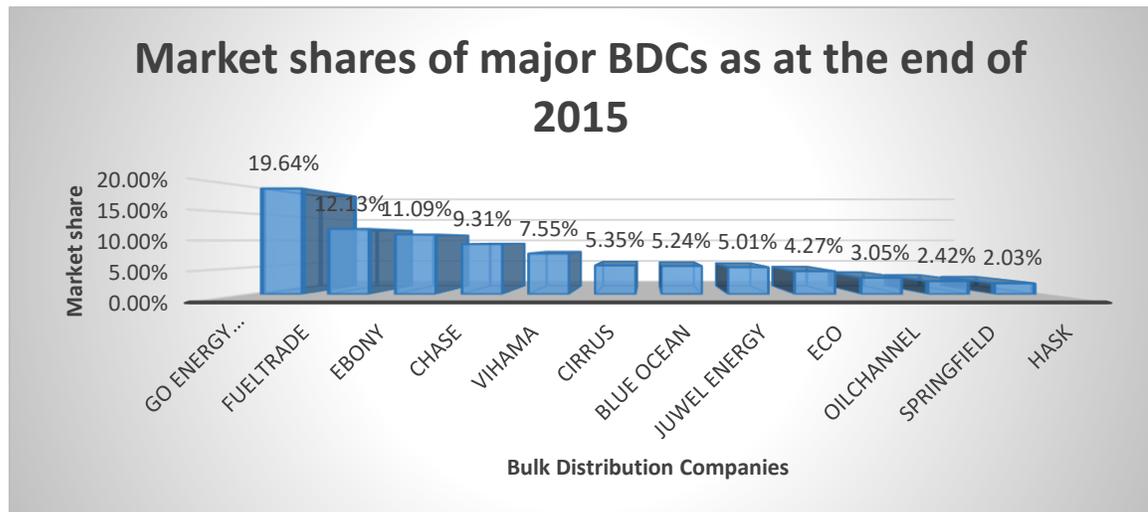


Figure 4. 4 Market shares of major BDCs as at September 2015

Source: NPA and author's drawing

Using 2015 data available at the NPA website to find the concentration of the 130 member BDCs market after deregulation, the Herfindahl-Hirschman Index for the top

four firms (GO Energy, Fueltrade, Ebony, and Chase) shows 0.069. This indicates a highly competitive market relative to the previous year. Even though it is too early, one could argue that the deregulation exercise may be an explanatory variable. Interestingly, this result differs sharply with the responses from the civil society organisations and the Organisation of Oil Marketing Companies. It was suggested that there is not a large competition in the BDCs market.

As at the end of 2014, the Herfindahl-Hirschman Index was 0.074 for the top four firms (Fueltrade, Vihama, Cirrus, and Chase). This shows a marginal improvement in the market competitiveness relative to the previous year. Similarly, the 2014, the market leadership situation was different. According to Figure 4.5 below, Fuel Trade was the leader with 18.59% market share.

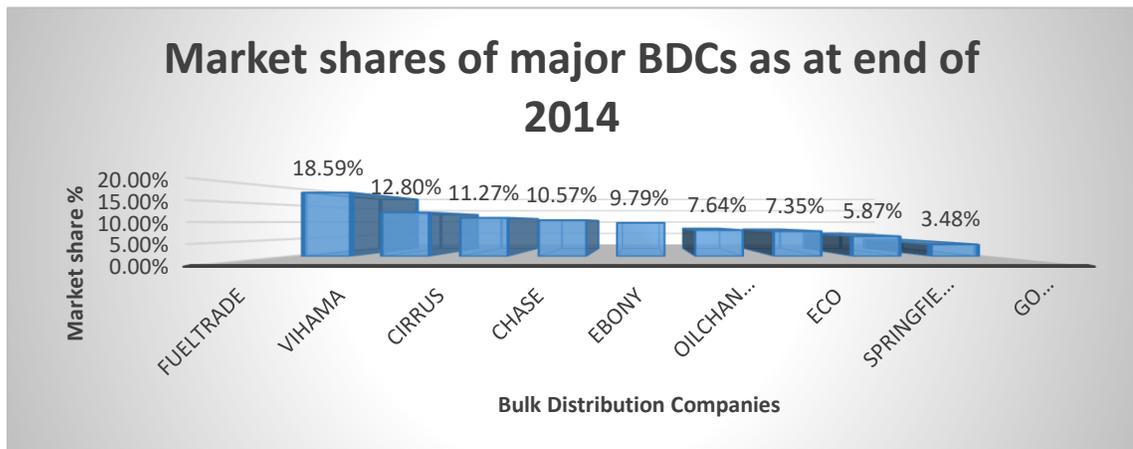


Figure 4. 5 Market shares of major BDCs as at end of 2014

Source: NPA and author's drawing

Meanwhile, the market outcome by the end of 2013 was also different, where Cirrus was the leader with 18.86% market share, as seen in Fig 4.6.

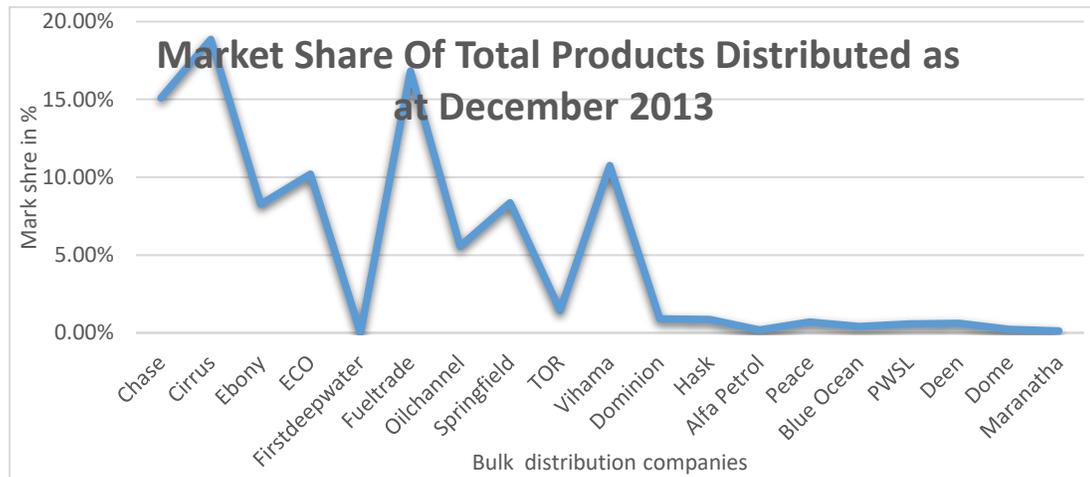


Figure 4. 6 Market share of BDCs as at end of 2013

Source: NPA and author’s drawing

Interestingly, the Herfindahl-Hirschman Index for 2013 was 0.098 which meant a lack of concentration.

4.1.3 The nature of the petroleum consumption in the downstream industry

Using 2010 data from the NPA, Table 4.1 below illustrates national consumption of petroleum products, which suggests that overall Gasoil (Diesel) was the most utilized product. Gasoil (Diesel) use accounted for 46.58% of product mix, as observed in Table 4.1 below.

Products	2010 National Consumption (MT)	2010 National Consumption (litres/LPG in kg)	% Products Mix
LPG	179,469.93	179,469,930	7.38%
Premix	33,872.97	45,467,010	1.39%
Kerosene	49,531.77	61,449,114	2.04%
ATK	107,328.45	133,151,675	4.41%
Gasoil (Diesel)	1,133,370.17	1,341,264,260	46.58%
Gasoline (Petrol)	843,751.24	1,132,550,414	34.68%
Fuel Oil	85,694.35	89,567,735	3.52%
Total	2,433,018.88	2,803,450,208	100%

Table 4. 1 Percentage consumption of petroleum products in 2010

Source: NPA (2010)

Similarly, Appendix 4 shows the consumption of petroleum products is to rise rapidly on the back of economic growth, according to the NPA. As indicated by Figure 4.1 above, the NPA estimates that the gap between total demand and the local refinery capacity through Tema Oil Refinery will continue to grow and more imports of refined products will, therefore, be required.

4.1.4 Petroleum products produced by the domestically in Ghana

Fig. 4.7 depicts the percentage spread of products produced by TOR in the year 2010. Gasoline is in the lead with 32.45%, Gas Oil follows with 31.03% and then ATK with 12.73%. The rest of the products such as Fuel oil, LPG, Premix and Kerosene had a total of 24%.

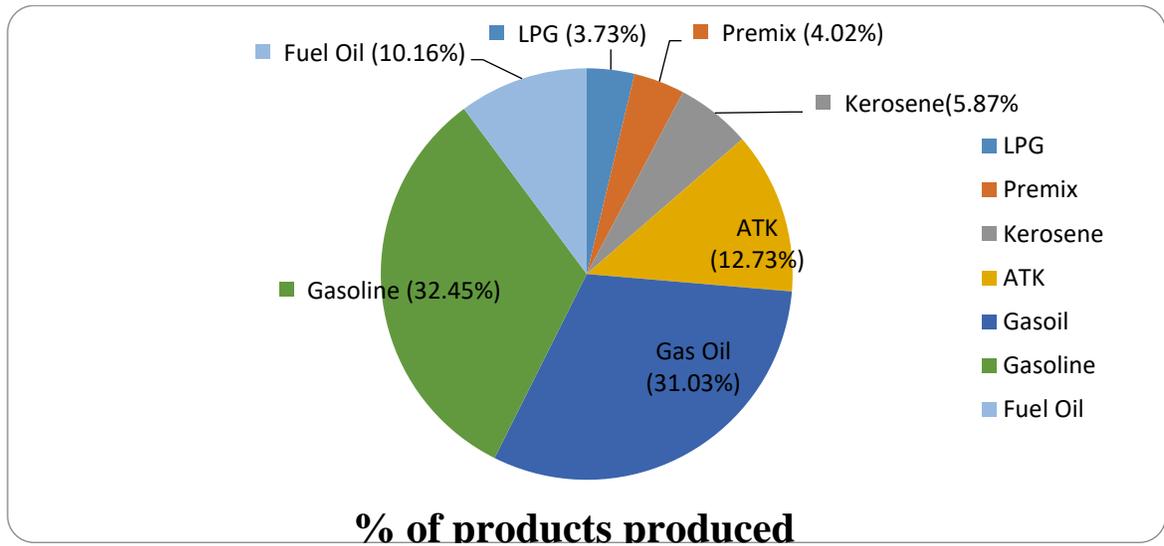


Figure 4. 7 Percentage of products produced by TOR

Source: NPA (2010)

4.1.5 Petroleum products imported in 2010

The lack of current data on petroleum products explain why 2010 data are used. Figure 4.8 below depicts the market share of Gas Oil (54.83%), Gasoline (35.86%) and LPG (9.31%) imported into the country. The high proportion of Gas Oil imported and produced in the country indicate that economic activities were vibrant in the year under review. It also presupposes that with deregulation, this volume of import is more likely to increase significantly.

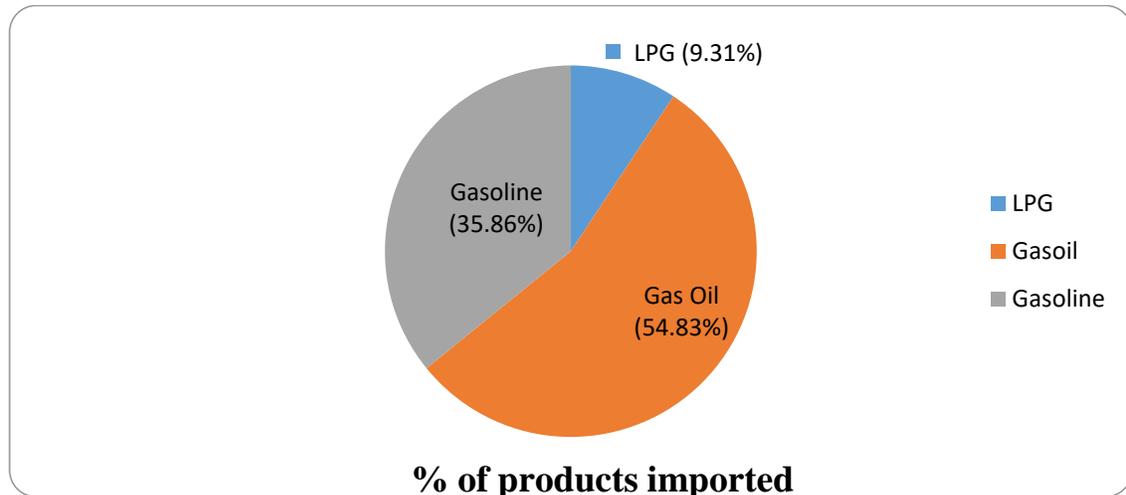


Figure 4. 8 Percentage of products imported by BDCs in 2010

Source: NPA (2010)

4.1.6 Historical supply of petroleum products

Analysed available data from the NPA shows that total national supply of petroleum products increased steadily from 1999 to 2013, until the economy faced sharp decline in supply in 2014, possibly due to the many problems associated with government intervention in the market. This phenomenon is illustrated on Figure 4.9 below. It is not surprising that a year after that decline, the government undertook the full price liberalisation policy, seeking to tackle the deficit, and to encourage market competition in the petroleum downstream industry.

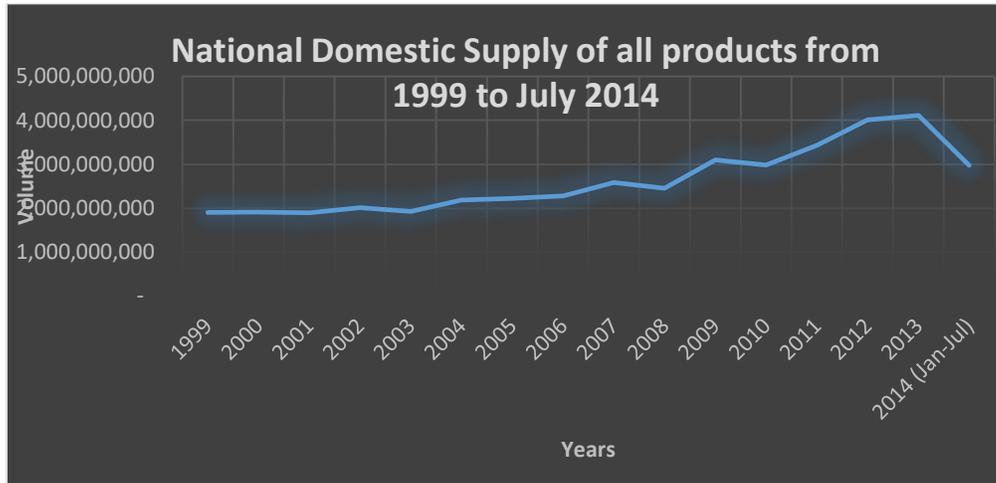


Figure 4. 9 Trend of national supply of petroleum products in Ghana prior to deregulation

Source: NPA (2010) and author's drawing

4.1.7 Distribution of petroleum product consumption per Region

Figure 4.9.1 below indicates that the Greater Accra Region consumed the highest volume of petroleum products between 2010 and 2014, with the Ashanti Region being the second largest consumer in the same period.

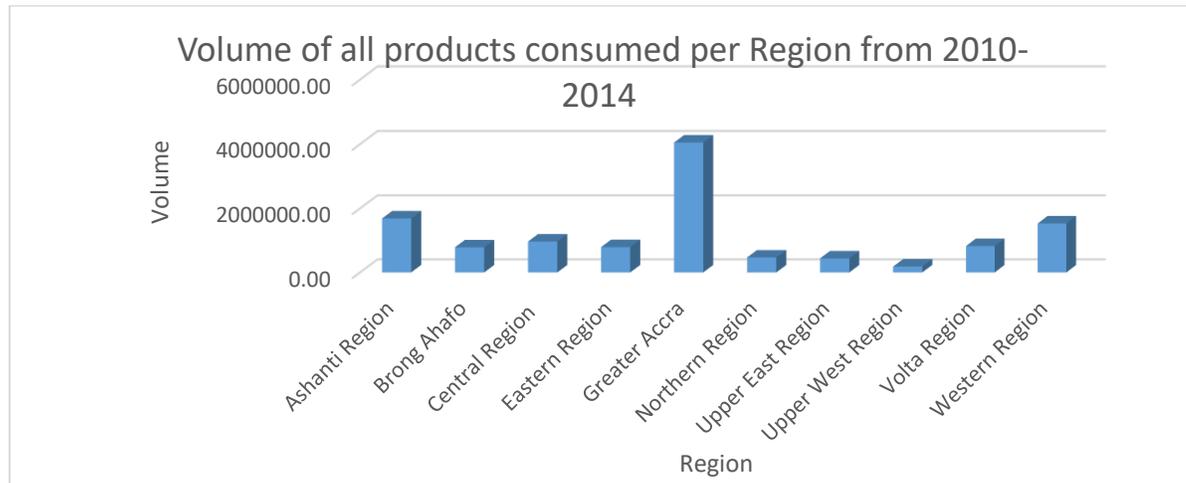


Figure 4.10 Volume of all products consumed per Regions of Ghana

Source: NPA (2010) and author's drawing

4.1.8 Institutional challenge I: The strategic position of the NPA in monitoring the BDCs and BDCs

The first research objective was to find the institutional challenges facing the NPA. Thus the following are the unfortunate institutional challenges identified.

1. Monitoring product quality twice at the ports and depots, and conducting field search twice a year by the NPA, raises concerns about quality at the outlets, especially when there are over 3100 outlets in Ghana.
2. According to the NPA, the commercial production of gas in Ghana has increased the responsibilities of the NPA. For example, with the operation of the Atuabo processing plant and Quantum Terminal, the NPA needs the

capacity building to regulate, monitor, and inspect the quality of the products being produced.

3. Product adulteration has fallen to 1.2% in 2014 from 32% in 2013, according to the NPA. This indicates the industry is still not 100% free of adulteration, confirming the presence of externalities due to deregulation.
4. On whether the NPA is independent to resist attempts by the government to reintroduce subsidies, especially during elections, the results indicate government has the power to use a certificate of urgency to alter market outcomes when oil prices are soaring. This is especially strong because there is a political cost to allowing oil price pass-through during election years. This tendency is what the North (1990) calls the “unfettered power of the Executive,” as highlighted by Acemoglu and Johnson (2004).
5. Unfortunately, another challenge threatening the sustainability of the full price deregulation is the lack of adequate capacity of some PSPs (especially the OMCs and LPGMCs) to set their prices, according to the NPA. This is because these OMCs and LPGMCs do not have the competencies in setting their ex-pump prices, possibly due to managerial ineffectiveness and other challenges. This is especially observed among the filling stations and resellers. On the other hand, the well-resourced OMCs are the service stations.
6. Even though the time is too short to determine the effectiveness of the deregulation exercise on competition, the Herfindahl-Hirschman Index for the four big OMCs after deregulation indicates that the market’s competitiveness

has declined marginally. This confirms the IMF findings that it takes time to realize the results of energy reform.

7. Since the deregulation exercise was passed, there has only been substantial declines in world oil prices, which has reflected in domestic prices of fuel, except that taxes reduced the benefits thereof to consumers. As a result, it is hard to conclude that OMCs are able to pass the full cost of oil price to consumers.
8. The results revealed that the OMCs and civil society organizations find the deregulation exercise incomplete because it does not consider the demographics of consumers. That is, an ex-pump price set by GOIL service station at Kanda, Accra, is the same for Adu-suazo, a village in Half-Assini. This makes it difficult to attract higher margins in Accra where purchasing power is relatively higher. Alternatively, people of lower income levels are required to purchase the same liter at a price as the rich. The researcher finds this uneconomic.
9. The findings also revealed that the price rigidity introduced by the NPA makes the deregulation exercise incomplete. That is, the OMCs cannot determine their own margins without approval from the NPA.
10. The findings further revealed that there is the Association of Oil Marketing Companies, consisting about 120 OMCs. The results could not indicate whether this association has the tendency to influence market outcomes. Especially when the market is deregulated to prevent collusion and

cartelization, the researcher thinks this could fuel market inefficiencies like price manipulation, collusions, and other practices.

4.2 The pass-through of Ghana's exchange rate shocks

The second objective of this research sought to first ascertain the pass-through effect of Ghana's exchange rate movement on petroleum prices. Therefore, sessions 4.2-4.2.3 provide evidence to support this objective.

From the Bank of Ghana's research and estimates illustrated by Figure 4.9.6 and Table 4.6 below, it is observed that the estimated cumulative pass-through coefficients point to the fact the effect of a nominal exchange rate shock on domestic prices are incomplete and broadly modest and fade within 18-24 months, but such impacts are mostly felt within 12 months.

The research was done using a recursive VAR to estimate the pass-through impact of exchange rate movements on domestic prices between January 1994 and December 2012. For example, it can be seen from Figure 4.11 that within the first three months of an exchange rate shock, the pass-through to non-food and CPI inflation were 13.3% and 6.5% respectively. On the other hand, as prices are adjusted over time to reflect the exchange rate movements, the pass-through rises steadily to 23.2% and 13.9% for non-food and CPI respectively within six months. It could be said that the impact of the exchange rate shock disappears completely after 36 months as the pass-through tapers off at 36.3% and 26.7% for non-food inflation and CPI inflation respectively (Bank of Ghana, 2014).

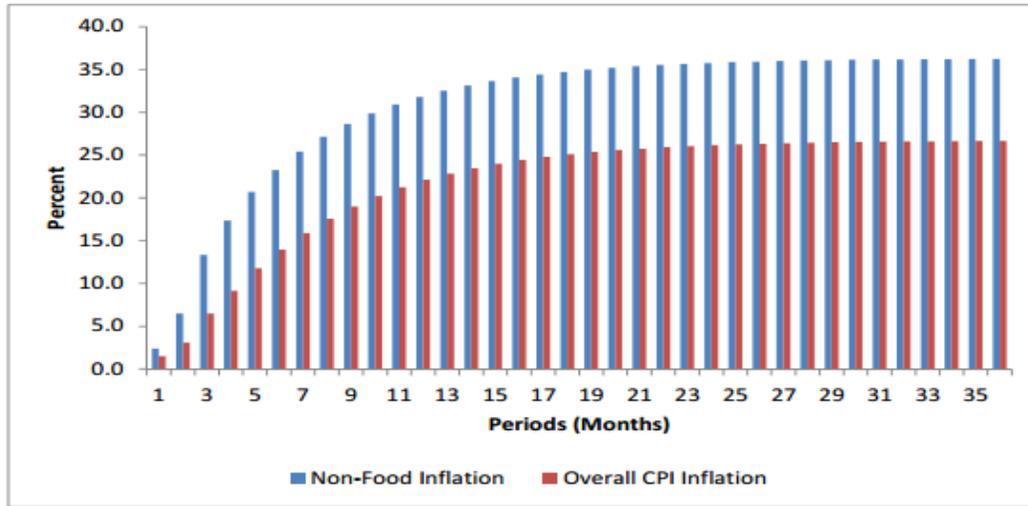


Figure 4. 10 Estimated cumulated pass-through coefficients

Source: Bank of Ghana (2014)

Periods (Months)	Non-Food Inflation	Overall CPI Inflation
3	13.3	6.5
6	23.2	13.9
9	28.6	19.0
12	31.8	22.1
15	33.6	24.0
18	34.7	25.1
21	35.4	25.8
24	35.8	26.2
27	36.0	26.4
30	36.1	26.5
33	36.2	26.6
36	36.3	26.7

Table 4. 2 Estimated cumulated pass-through coefficients

Source: Bank of Ghana (2014)

4.2.1 Effect of Ghana's exchange rate pass-through on petroleum prices

This part provides further evidence to support the first objective. This session identifies the exchange rate movement with particular emphasis on petroleum prices.

The Bank of Ghana (2014) estimates that generally the impact of the exchange rate shock on Ghana's CPI is more benign than for non-food inflation. This phenomenon is due to several explanations. First, this might be due to the fact that non-food inflation contains a greater share of tradable goods and services compared to CPI inflation.

The Bank also identifies that it is possible that producers do not have the pricing power to fully adjust their prices to reflect the exchange rate shock, thereby forcing profit margins to contract in order to absorb the exchange rate shock with consumer prices minimally impacted, a situation that is not conducive for investment, growth and employment generation, implying that a stable currency is a necessary pre-requisite for sustainable growth.

In contrast to the pass-through coefficients, the Bank uses another tool -variations decomposition-that helps to assess the importance of exchange rate shocks in explaining the behavior of non-food and CPI inflation. Alternatively, relying on their estimations illustrated by Tables 4.3 and 4.4 below, the Bank has found that in line with empirical regularity and consistent with the pass-through coefficients estimates, the effect of the exchange rate shock on CPI inflation fluctuations is more benign than for non-food inflation. From Table 4.9.4, only about 7% of the variation of CPI inflation is explained by the exchange rate shock, non-food inflation innovations account for about 58%, own-

innovations explain about 30% while the remainder of the variation is explained the other variables.

Percentage of forecast error variance attributed to:						
Forecast Horizon	Oil Prices	Output Gap	Exchange Rate	Non-Food Inflation	CPI Inflation	Interest Rates
3	2.74	0.31	4.04	87.36	3.65	1.90
6	3.03	0.47	8.88	79.98	4.34	3.29
9	3.16	0.50	11.19	76.98	4.27	3.90
12	3.21	0.50	12.18	75.76	4.20	4.15
15	3.22	0.50	12.57	75.28	4.18	4.25
18	3.23	0.50	12.72	75.09	4.16	4.30
21	3.23	0.50	12.78	75.02	4.16	4.31
24	3.23	0.50	12.80	75.00	4.16	4.32
27	3.23	0.50	12.81	74.99	4.16	4.32
30	3.23	0.50	12.81	74.98	4.16	4.32
33	3.23	0.50	12.81	74.98	4.16	4.32
36	3.23	0.50	12.81	74.98	4.16	4.32

Table 4. 3 Variance decomposition of non-food inflation

Source: Bank of Ghana (2014)

Percentage of forecast error variance attributed to:						
Forecast Horizon	Oil Prices	Output Gap	Exchange Rate	Non-Food Inflation	CPI Inflation	Interest Rates
3	0.86	0.22	1.27	62.49	33.98	1.19
6	1.15	0.44	3.88	61.03	31.35	2.15
9	1.36	0.53	5.73	59.66	30.04	2.69
12	1.45	0.54	6.65	58.96	29.49	2.91
15	1.48	0.54	7.04	58.66	29.28	3.00
18	1.49	0.54	7.19	58.54	29.20	3.04
21	1.50	0.54	7.25	58.49	29.17	3.06
24	1.50	0.54	7.27	58.48	29.15	3.06
27	1.50	0.54	7.28	58.47	29.15	3.07
30	1.50	0.54	7.28	58.47	29.15	3.07
33	1.50	0.54	7.28	58.47	29.15	3.07
36	1.50	0.54	7.29	58.47	29.15	3.07

Table 4. 4 Variance decomposition of non-food inflation

Source: Bank of Ghana (2014)

According to the Bank of Ghana (2014), oil prices explain just a minimal variance in non-food and CPI, and this reflects non-automatic adjustment in domestic ex-pump price of oil to reflect conditions in the international market. The Bank expected that the regular application of the automatic adjustment formula with exchange rate movements as one of its underlying triggers will increase oil price's contribution to the variance of domestic prices. This phenomenon effectively signals that the price liberalization is a fertile ground for higher variations contributed by oil.

4.2.2 Bank of Ghana's perceived challenges in implementing sound monetary policy

This session identifies specific challenges the Bank of Ghana perceives to be faced with while implementing sound monetary policy.

Results obtained from the Bank of Ghana indicate that the Bank faces various challenges while seeking to implement a sound and stable monetary exchange rate. The central bank alone cannot stabilize the cedi. It is the entire spectrum of macroeconomic policy that will together stabilize the cedi (Bank of Ghana, 2016). Key among the challenges include the following.

1. The rising expectations of consumers, businesses, banking sector players.
2. The inflationary environment.
3. Fiscal imbalances resulting from structural deficiencies in the economy, like trade imbalances, declining revenues, rising government deficit to GDP.

4. Excessive and persistent lending to the government as mandated by Bank of Ghana Act, 2002 (Act 612) (Bank of Ghana, 2016).

Bank of Ghana Monetary Policy Committee Press Releases over the past four years indicate that the Bank of Ghana identifies these challenges to be impeding the efforts of BoG in restoring monetary discipline. As part of measures to restore the health of the monetary system, in February 4, 2014, the Bank issued three notices on: operations of foreign exchange accounts (FEA) and foreign currency accounts (FCA), repatriation of export proceeds, and additional operating procedures for Forex Bureaux in Ghana.

Consequently, the challenges of the macroeconomic environment forced the Bank to revise those measures in June 13, 2014 (Bank of Ghana, 2014).

4.2.3 Measures in restoring the health of the monetary policy

In the view of the Bank of Ghana, the following are measures put in place to tackle recent depreciation of the Cedi.

The Bank identified some measures put in place over the years to address the exchange rate shocks: policy rate increases to tighten the money supply, selling additional forex, export repatriation-how to improve more currency into the banking system and ensuring that all exporters repatriate their funds into the banking system-educating financial product consumers to restore confidence in the economy, entering into a 3-year program with the International Monetary Fund that was expected to affect the Bank's balance sheet by improving its reserves which would in turn be used to

support the balance of payments and the local currency, and collaborating with fiscal authorities to improve fiscal consolidation.

4.2.4 Institutional challenge II: Ensuring sound monetary policy

The second objective of this research sought to identify particular challenges the Bank of Ghana faces in implementing sound and stable monetary policy. Thus, the following evidence supports this objective.

1. The responses of the Bank largely indicate the failures and weaknesses of the Bank in discharging its duties. For example, one of the few research papers informing decisions of the Bank on the exchange rate pass-through in Ghana was last published in 2014, a year before the energy reform. Further to this, the research does not capture the substantial depreciations of the Cedi in 2014, since the research considered the years between 1994 and 2012. This creates a deep knowledge gap in implementing informed monetary policies.
2. One of the weaknesses of the Bank's research is that it does not consider the effect of the subsidy on petroleum products. Rising oil price is considered as one of the causes of inflation. But in Ghana, oil prices were hugely subsidised. Thus any study without that subsidy would produce results inconsistent with actual market realities.
3. In a related development, the forex measures that were introduced in 2014 by the Bank to tackle the worsening rate of the Cedi, were largely restrictive, and it could only be effective for reducing economic activity, which was

counterproductive to inflation targeting. As such, it could be argued that the identified challenges are evidences of the failure of the Bank, the regulator.

4. In addition, lending excessive amounts of money to the central government while raising monetary policy rate as was done simultaneously by the Bank, was a sign of institutional weakness. Raising the monetary rate is intended to reduce monetary supply so that inflation could be checked. And lending to the government does one thing: it increases the money supply, since the government would in turn spend. This is counterproductive to inflation targeting.
5. Since the governor of Bank of Ghana is usually appointed by the President a year after general elections under the 4th Republic (1992) with the exception of Dr. G.K. Agama from 1988-1997, this confirms the theory that such appoints threaten the independence of the Bank. The effect of this phenomenon is that the governor is unable to ensure sound economic discipline, hence allowing fiscal indiscipline on the part of the Executive. This is a strong sign of institutional weakness.

4.3 Tax components of petroleum products

The third research objective was to first determine the key factors accounting for the higher effect of tax components on petroleum products. Thus, this session provides evidence to support this objective.

The new Energy Sector Levies Act 2015 (Act 899) discusses the taxes and levies charged on certain petroleum products. The results obtained show that LPG does not attract Road Fund and Energy Fund.

The name and purpose of those taxes and levies are shown in Table 4.5 below. Together with the statutory margins and margins of the various players, the ex-pump price tends to rise with any change in any of the components.

Tax/Levy	Purpose
Excise Duty	Any duty other than an export duty of customs imposed on petroleum products consumed in Ghana.
Energy Debt Recovery Levy	To facilitate the debt recovery of the Tema Oil Refinery, down- stream petroleum sector foreign exchange under recoveries and power generation and infra- structure support.
Road Fund Levy	To support road maintenance. It constitutes a part of the Road Fund established under the Road Fund Act, 1997 (Act 536).
Energy Fund Levy	To be used for the activities of the Energy Commission as stated in the Energy Commission Act, 1997 (Act 541).
Price Stabilisation and Recovery Levy	To be used as a buffer for under recoveries or subsidies to stabilize petroleum prices for the consumer.

Table 4. 5 New taxes and levies on petroleum produces

Source: NPA (2016)

4.3.1 Institutional challenge III: The burden of taxation on petroleum products

The third research objective also sought to identify how the higher taxes affect consumers of petroleum products. The evidence below helps to achieve that objective.

Among the burdens of the petroleum tax has been the increases in taxes which prevents consumers from enjoying low ex-pump prices, thus increasing their expenditure

on the same unit of petroleum products. This is an indication of institutional weakness on the part of the government acting through the Finance Ministry. This is because some of the taxes are as a result of financial misappropriations, which could be due to the lack of enforcement and application of legal framework by the responsible institutions.

The following illustrations indicate the effect of some of the new taxes on revenue and expenditure that are contained in new Energy Sector Levies Act 2015 (Act 899).

Item	Petrol	Diesel	LPG
Power Generation and Infrastructure Support levy (Ghp/Ltr or kg)	0.28	0.28	0.28
Estimated Volumes of product consumption – 2015 (Ltr or kg)	1,515,164,700	1,899,281,160	272,789,172
Revenues from levies (GHS)	424,246,116	531,798,724.8	76,380,968.16
Total Annual Revenue (GHS)			1,032,425,809

Table 4. 6 Power generation and infrastructure support levy on petroleum products

Source: ACEP (2016)

As seen from Table 4.5, ACEP analyzed the size of annual revenues to be generated from the levy based on product consumption (petrol, diesel, and LPG) using 2015 data. ACEP realized that the new levy could generate more than GHS 1 billion in a year, which is how much burden being placed on petroleum products consumers. This effectively

means that for the same unit to be consumed, consumers would have to pay over GHS1 billion more in taxes in the coming years, *ceterus paribus*.

Similarly, with the introduction of the Price Stabilization and Recovery Levy, which is to provide a buffer for under-recoveries in petroleum sector, to stabilize petroleum prices and to subsidies pre-mix and residual fuel oil, ACEP observed that the levy could generate about GHS 400 million annually based on 2015 consumption levels of the same products: petrol, diesel, and LPG. Table 4.6 shows this analysis below.

Item	Petrol	Diesel	LPG
Price Stabilization and Recovery Levy	0.12	0.10	0.10
Estimated Volumes of product consumption - 2015	1,515,164,700	1,899,281,160	272,789,172
Revenue from levy	181,819,764	189,928,116	27,278,917.20
Total Annual Revenue			399,026,797.20

Table 4. 6: Price stabilization and Recovery levy

Source: ACEP (2016)

Table 4.6 indicates that to consume the same unit of petroleum products in 2016, for example, consumers would need to pay about GHS400 million more in additional taxes for the purpose of the new stabilization and recovery levy.

More importantly, the tax structure reveals that consumers are double taxed, because of the introduction of the Special Petroleum Tax (SPT), as seen in Appendix 3. From Table 4.7 below, it can be observed that the effect of the 17.5% Special Petroleum

Tax, which is a tax on several other taxes, levies, and margins, would be about GHS675 million in revenues that would be coughed up by consumers in just a year.

Products	Petrol	Diesel	LPG	
Consumption Volumes	1,515,164,700	1,899,281,160	272,789,172	
Levies Before SPT	105.78	103.78	103.78	
Total Revenue	1,602,741,219.66	1,971,073,987.85	283,100,602.70	3,856,915,810.21
SPT (17.5%)				674,960,266.79

Table 4.7 Size of double taxation on consumers

Source: Africa Center for Energy Policy (2016)

Table 4.7 above indicates an additional GHS 675 million taxes being imposed on consumers for the same unit of petroleum products to be consumed. This confirms the economic convention that due to the inelastic demand for petroleum products, governments are able to raise more revenue from petroleum products consumption.

To understand the impact of the levies on petroleum product prices, a comprehensive analysis conducted by ACEP (2016) was used, as seen in Appendix 1. According to ACEP, since the Act 899 was passed and the various levies applied, there

have been different versions of the relative impact of the levies on the ex-pump prices of petroleum products. For example, the Minister of Finance told Parliament of Ghana that the effect of the levies would amount to a 5% increase in the price of petroleum, 2.9% in the price of diesel, and 1.74% in LPG price, as shown in Table 1.1.

However, ACEP (2016) observed that the effects of the levies on ex-pump prices are much greater and punitive. ACEP (2016) estimated the levies had led to increase in the ex-pump price of petrol per liter by 33%, 40% on diesel per liter, and 22% on LPG per kilogram.

Also, with the current levies, the tax component in proportion to the ex-pump prices of petrol and diesel are 41% and 42% respectively. This result is indicated in Appendix 1. The IMF shows that average tax share in ex-pump prices of petrol and diesel in developing countries ranges between 22% and 30%. This effectively means that the share of taxes in petroleum prices in Ghana is one of the highest in the developing world.

Furthermore, there are concerns of imposing extreme and additional burden on consumers due to the imposition of the BOST margin, since BOST is already renting out its facilities to BDCs and the BDCs pass this rental cost through their margins (ACEP, 2016). ACEP (2016) has also revealed that TOR Debt Recovery Levy has been overpaid.

Even though the exploratory levy was abolished by Act 899, which seemed to relieve consumers, the new levies have significantly neutralized the effect of the abolished levies. Also, the introduction of Act 899 led to astronomical increases in old

levies. For instance, the Road Fund has been increased by 433%. In addition to this, the cross subsidy levy has been repackaged into the Price Stabilization and Recovery Levy, and it is now limited to only pre-mix and residual fuel oil, according to ACEP.

According to ACEP (2016), consumers have overpaid the TOR debt. This is because at the time the levy was instituted, TOR debt stood at GHS450 million. By 2009, the total debt had grown to GHS900 million due to non-application of the revenues to service the debt as well as interest accumulation. In a press statement, ACEP (2016) stated that, “Our analysis shows that between 2009 and 2015, the total collection from the levy is in excess of GHS1.9 billion. This effectively amortizes the debt, assuming an interest rate of 10%.” Therefore, the continual repayment of TOR debt is a sign of institutional failure and weakness. For example, TOR Debt Recovery Fund Levy Act 2003 (Act 642) states that, “The Minister shall within three months after the end of each financial year, submit a report on the Fund to Parliament.” There is evidence to the effect that the Finance Minister failed to comply with the legislative requirement, according to ACEP(2016).

Apart from paying higher electricity tariffs, consumers are also being mandated to pay debts accumulated from inefficiencies on the part Volta River Authority and Electricity Company of Ghana, through the introduction of the Power Generation and Infrastructure Support Levy. This is the climax of the power of the executive arm of government, reflecting how consumers are taxed to pay for inefficiencies and failures of

state institutions. More worrying is the fact that consumers and the general public do not know the exact amount of the debt they are paying for.

4.4 Civil societies' role under deregulation

Last but not, the fourth research objective was to investigate ways the various civil society organisations participate in making the deregulation exercise effective and sustainable. Below are some evidence supporting this objective.

The Responses analyzed suggest that the various civil society organisations are actively engaged in the downstream industry, primarily in the form of advocacy. Examples of these organisations are the Africa Centre for Energy Policy, Imani Ghana, the Institute of Economic Affairs, the African Centre for Economic Transformation, and many other partners. These organisations provide alternative policies, value for money analysis, and they advocate for transparency and accountability in revenue and expenditure management. According Imani Ghana, “The CSOs mainly will act as 'watchdogs' to ensure all stakeholders play by the book.”

4.4.1 Institutional challenge IV: Impediments to the CSOs

The following are considered as challenges facing the civil organisations, particularly with their participation in the petroleum downstream industry. This session answers the last part of the fourth objective.

First, primarily, the challenge has been the opacity of information as well as the technical nature of scant information that is made available. Thus, the final consumer is not empowered to demand appropriate prices from OMCs, for example (Imani Ghana,

2016), (ACEP, 2016), and (IEA, 2016). This phenomenon makes the work of these organisations hard, since they rely on information to make their publications.

Secondly, there is a high tendency to be named anti-government when some publications are more revealing. This atmosphere does not encourage private participation, and it has the potential to tarnish the image of such organisations, or persons within those organisations.

Chapter 5: Conclusions and Recommendations

5.0 Conclusions

By observation, it can be said that it is too early to determine the impact of the deregulation exercise.

Also, it is observed that the National Petroleum Authority still remains relevant, in terms of monitoring the performance of the downstream market. However, its responsibilities are extended to cover the activities of the Atuabo processing plant. The increasing number of BDCs, OMCs, LPGMCs, and other petroleum service providers (PSPs), calls for a well-resourced regulator.

It also revealed that the government still has the power to use certificate of emergence to influence market outcomes, especially during elections.

In addition, some small OMCs lack the capacity to determine their own prices, and this signals the strength of those players in a deregulated market. The effect is that, if

these small firms fail to improve operations, resulting in shut-downs, the market could favor the big four players, which could reduce competition.

Furthermore, the formation of associations of the various market players could threaten the success of the deregulation exercise. The researcher believes that such associations would be useful and relevant if the government still controlled the market.

The results revealed that the major threats to the deregulation exercise are the freight on board (FOB) charges- caused by the exchange rate movements-the taxes on the petroleum products, and the world oil price. Though taxes remain constant over long periods, world oil prices and FOB charges change over.

Since the two main threats to the deregulation are as a result of foreign trade, resourcing Tema Oil Refinery and encouraging private sector participants in the refinery of petroleum products, could be a game changer, especially in terms of strengthening the Cedi, and reducing trade imbalances.

The civil society organizations play a significant role in promoting the interests of the general public. However, inadequate data availability and negative tagging threaten their work.

5.1 Recommendations

Based on the above conclusions, the following recommendations are made.

First, the National Petroleum Authority needs further strengthening. The NPA must invest in innovative ways in performing its duties: employ more advanced

technologies to monitor products characteristics, resource its human capital to provide more accurate information to the general public, for example, and increase its presence in the various districts through partnership with other institutions, CSOs, and other private players.

Second, Parliament of Ghana may have to passage Legislative Instruments to make the arbitrary reversal of the deregulation exercise by the government more costly and punitive. This would sustain the deregulation in election years, and it would absolutely take governments out of the market.

Third, Parliament may have to consider the passage of anti-trust laws to check cartelization and other market inefficiencies. This is because the NPA Act is insufficient to tackle the issues of collusion. This is especially necessary because the deregulation exercise is expected to attract huge investments in the future, which could lead big firms to consolidating. It could also check mergers and acquisitions.

Fourth, since TOR has largely remained inefficient due to poor management, government could enter into private-public partnerships to make it operational and economically attractive. This could save Ghana some millions of Dollars that would otherwise be spent on imports.

Fifth, another option to increase local refineries could be attracting private players to set up refineries. This could be done through tax breaks and friendly environments, in terms of infrastructure.

Sixth, Parliament may also have pass legislations to restrain excessive and incessant lending by the Bank of Ghana. The current legal framework has been largely supportive of lending, which has made monetary policy largely ineffective and unfriendly.

Also, the passage of the Right to Information Bill and the Ghana Extractive Industry Transparency Initiative Bill would advance access to information. This would promote the work of civil societies that rely on such information for public education. Such Bills must be instructive to encourage its enforcements.

Other recommendations are that other researchers should study the full effect of the exchange rate pass-through, especially when there is fuel reform.

Also, a comparative analysis of the effect of an operation TOR on the Ghanaian economy, especially when there is deregulation, would be helpful. This could encourage government to invest in TOR.

After some reasonable time, researchers must consider the effect of the deregulation exercise on prices.

GHANA

5.2 Appendixes

APPENDIX 1: The targeting efficiency of social protection programs in Ghana**(percentage of each program benefits that reach the poorest quintile)**

	Share of outlays benefiting the poor	Simulated vs. actual
Well or potentially well targeted programs		
LEAP (Livelihood Empowerment Against Poverty)	57.5	Actual (good data)
NHIS indigent exemption	>50.0	Actual (partial data)
Free School uniforms for primary schools in poor areas	49.9	Simulated
Labor intensive public works in poor areas	>43.2	Simulated
Proxy means-tested conditional cash transfers for JHS	42.2	Simulated
Programs/subsidies benefitting the population fairly evenly		
General funding for primary education	32.2	Actual (good data)
General funding for health service delivery by CHAG	30.8	Actual (good data)
Potential connections subsidies for electricity	29.4	Simulated
Free maternal (ante- and post-natal) and child care	29.1	Actual (good data)
General funding for kindergarten education	27.2	Actual (good data)
General funding for JHS education	24.0	Actual (good data)
General funding for health care	22.4	Actual (good data)
Ghana School Feeding Programme	<21.3	Actual (partial data)
Kerosene subsidies	20.7	Actual (good data)
Programs and subsidies with limited benefits for the poor		
General funding for vocational (TVET) education	19.0	Actual (good data)
Fertilizer subsidy scheme	15.8	Actual (partial data)
General funding for SHS education	15.1	Actual (good data)
PURC pilot access to safe water through tankers in cities	13.1	Simulated
National Youth Employment Program (NYEP)	12.7	Simulated
NHIS general subsidies	12.4	Actual (partial data)
Poorly targeted programs and subsidies		
Tax cut on imported rice during food price crisis	8.3	Actual (good data)
Electricity subsidies embedded in tariff structure (in 2005/06)	8.0	Actual (good data)
General funding for tertiary education	6.9	Actual (good data)
Subsidies for petrol and diesel products (except kerosene)	>2.3	Actual (good data)

Source: Cooke et al (2014)

Appendix 2: Ex-refinery price build up for BDCs and Refineries

EX-REFINERY PRICE BUILD-UP FOR BDCs & Refineries								
	Unit		Premium	Kerosene	Gasoil	MGO Local	LPG	Kero Mines
FOB PRICE (Platts & Argus Referenced)	USD/MT	a						
Suppliers Premium (Total Related Charges)	USD/MT	b						
Ex-Refinery Price	USD/MT	$c = a + b$	.	.	.	.	.	.
Conversion Factor	Lt/MT	d	1342.28	1240.6	1183.43	1183.43	1000	1240.6
Ex-Refinery Price	USD/Lt	$e = c/d$	.	.	.	.	.	.
Exchange Rate	GHS/USD	f						
Ex-Refinery Price	GHS/Lt	$g = e*f$	.	.	.	.	.	.
Ex-Refinery Price	GHP/Lt	$h = g*100$	.	.	.	.	.	.

Source: NPA (2016)

Appendix 3: Ex-pump price build-up for OMCs & LPGMCs

	Unit		Premium	Kerosene	Gasoil	MGO Local	LPG	Kero Mines	Unified
EX-REFINERY PRICE	GHp/Lt	a							
EXCISE DUTY	GHp/Lt	b	2.7800	1.0370	1.8000	0.2945	0.7246	1.0370	2.7800
ENERGY DEBT RECOVERY LEVY	GHp/Lt	c	41.0000		41.0000	3.0000	37.0000		41.0000
ROAD FUND LEVY	GHp/Lt	d	40.0000		40.0000				40.0000
ENERGY FUND LEVY	GHp/Lt	e	1.0000	1.0000	1.0000			1.0000	1.0000
PRICE STABILIZATION AND RECOVERY LEVY	GHp/Lt	f	12.0000		10.0000		10.0000		
PRIMARY DISTRIBUTION MARGIN	GHp/Lt	g	5.5000	5.5000	5.5000			5.5000	
BOST MARGIN	GHp/Lt	h	3.0000	3.0000	3.0000			3.0000	
FUEL MARKING MARGIN	GHp/Lt	i	1.5000	1.5000	1.5000	1.5000		1.5000	1.5000
EX-DEPOT	GHp/Lt	j = a+...i	106.7800	12.0370	103.8000	4.7945	47.7246	12.0370	86.2800
SPECIAL PETROLEUM TAX	GHp/Lt	k = 17.5%	18.6865	2.1065	18.1650	0.8390	8.3518	2.1065	15.0990
UPPF	GHp/Lt	l	10.0000	11.0000	10.0000	10.0000	12.0000	11.0000	
MARKETERS MARGIN	GHp/Lt	m							
DEALERS (RETAILERS/OPERATORS) MARGIN	GHp/Lt	n							
LPG FILLING PLANT/Premix/MGO Local Admin Costs	GHp/Lt	o				0.3000	4.7753		
DISTRIBUTION COMPENSATION/PROMOTION MARGIN	GHp/Lt	p		7.0000			5.0000	7.0000	
INDICATIVE MAXIMUM PRICE (EX-PUMP PRICE)	GHp/Lt	q = j+...+p	135.47	32.14	131.97	15.93	77.85	32.14	101.38

Source: NPA (2016)

Appendix 4: Petroleum Products Consumption

Petroleum Products ('000 tonnes)	2008	2012	2015	2020
LPG	134.0	176.0	237.0	300
Kerosene and Jet Fuel	219.0	242.0	300.0	350.0
Diesel	1,128.0	1,470.0	1,800.0	2,100.0
Gasoline Premium	711.0	825.0	970.0	1,200.0
Gasoline Pre-mix	70.0	75.0	80.0	85.0

Source: NPA (2015)

Appendix 5: Impact of Levies on Ex-pump Prices

Price Build Up With Old Levies based on January 1, 2016 Prices

Item	PETROL	DIESEL	LPG
Xpi	159.1704	146.1864	185.4223
RECOVERY MARGIN	-	-	12.6796
EX-REFINERY PRICE	159.1704	146.1864	198.1019
EXCISE DUTY	2.7800	1.8000	0.7246
TOR DEBT RECOVERY LEVY	8.0000	8.0000	5.0000
ROAD FUND	7.3231	7.3231	-
ENERGY FUND	0.0500	0.0500	-
EXPLORATION	0.1000	0.1000	-
CROSS-SUBSIDY LEVY	5.0000	-2.6987	-18.4042
PRIMARY DISTRIBUTION MARGIN	4.5000	4.5000	-
BOST MARGIN	3.0000	3.0000	-
FUEL MARKING MARGIN	1.5000	1.5000	-
EX-DEPOT	191.4235	169.7608	185.4223
SPECIAL PETROLEUM TAX	33.4991	29.7081	32.4489
UPPF	9.0000	9.0000	11.0000
MARKETERS MARGIN	16.0000	16.0000	10.595
DEALERS (RETAILERS/OPERATORS) MARGIN	11.1400	11.1400	7.9750
LPG FILLING PLANT/Premix/MGOLocal Admin Costs			4.7753
DISTRIBUTION COMPENSATION MARGIN/PROMOTION MARGIN			5.0000
EX-PUMP PRICE	261.0626	235.6090	257.2165

Source: ACEP (2016)

Price Build up with New Levies based on 1st January Prices

Item	PETROL	DIESEL	LPG
Xpi	159.1704	146.1864	185.4223
EX-REFINERY PRICE	159.1704	146.1864	185.4223
EXCISE DUTY	2.7800	1.8000	0.7249
ENERGY DEBT RECOVERY LEVY	41.0000	41.0000	37.0000
ROAD FUND	40.0000	40.0000	-
ENERGY FUND	1.0000	1.0000	-
PRICE STABILIZATION & RECOVERY LEVY	12.0000	10.0000	10.0000
PRIMARY DISTRIBUTION MARGIN	4.5000	4.5000	-
BOST MARGIN	3.0000	3.0000	-
FUEL MARKING MARGIN	1.5000	1.5000	-
EX-DEPOT	264.9504	248.9864	233.1472
SPECIAL PETROLEUM TAX	46.3663	43.5726	40.8008
UPPF	9.0000	9.0000	11.0000
MARKETERS MARGIN	16.0000	16.0000	10.5950
DEALERS (RETAILERS/OPERATORS) MARGIN	11.1400	11.1400	7.9750
LPG FILLING PLANT/Premix/MGOLocal Admin Costs	-	-	4.7753
DISTRIBUTION COMPENSATION MARGIN/PROMOTION MARGIN	-	-	5.0000
EX-PUMP PRICE	347.4567	328.6991	313.2933

Source: ACEP (2016)

GHANA

Summary of the impact of New Levies

ANALYSIS	PETROL	DIESEL	LPG
PRICE BUILD-UP OLD LEVIES (JAN 1, 2016)			
Total Taxes (Ghp/Ltr or kg)	56.7522	44.2825	32.4489
Percentage of total taxes of ex-pump (%)	21.74%	18.79%	12.62%
Total Margins (Ghp/Ltr or kg)	18.00	18.00	16.00
Percentage of margins of ex-pump (%)	6.89%	7.64%	6.22%
Ex-pump prices (Ghp/Ltr or kg)	261.06	235.61	257.22
PRICE BUILD-UP NEW LEVIES (JAN 1, 2016)			
Total Taxes (Ghp/Ltr or kg)	143.15	137.37	88.53
Percentage of total taxes of ex-pump (%)	41.20%	41.79%	28.26%
Total Margins (Ghp/Ltr or kg)	18.00	18.00	16.00
Percentage of margins of ex-pump (%)	5%	5%	5%
Ex-pump prices (Ghp/Ltr or kg)	347.46	328.70	313.29
COMPARATIVE PBU ANALYSIS (NEW VS OLD)			
Increase in levies (Ghp/Ltr or kg)	86.39	93.09	56.08
Estimated Annual Volumes (Ltrs or Kg)	1,515,164,700	1,899,281,160	272,789,172
Incremental tax revenue (GHS3,230,026,693)	1,309,013,020	1,768,042,351	152,971,322
Change in ex-pump price (Ghp/Ltr or kg)	86.39	93.09	56.08
Percentage Change in ex-pump price (%)	33%	40%	22%

Source: ACEP (2016)

Appendix 6: Sample research questions for the National Petroleum Authority

Ashesi University College

Exploring the potential benefits of strengthening institutions to the economy of Ghana: The case of the downstream full petroleum sector deregulation in Ghana.

Investigator: Shedrach Gyeni Akesse

Contact: shedrach.akesse@ashesi.edu.gh

Supervisor: Dr. Stephen Armah.

Contact: searmah@ashesi.edu.gh

Semester: Spring

To the respondent:

Please, participation in this research is voluntary, and you may withdraw your participation with no penalty. Also, information received is deemed public, unless stated otherwise. You may request for anonymity.

Interview: *Please, this interview, among other things,* is to understand how the National Petroleum Authority is positioned to exercise its role in the deregulated petroleum sector.

Structured Research Questions for the National Petroleum Authority (NPA)

1. The government has fully deregulated the downstream petroleum sector through the NPA. What are the implications of this deregulation exercise on
 - a. the National Petroleum Authority itself
 - b. the Oil Marketing Companies (OMCs)
 - c. the Bulk Distribution Companies (BDCs)
 - d. Tema Oil Refinery (TOR)
 - e. Bulk Oil Storage and Transportation Company Limited (BOST)
2. Prior to full deregulation, the NPA set prices of petroleum products.
 - a. What major factors were considered to set ex-pump prices?
 - b. Which of the factors was the most significant?
3. Full deregulation is likely to deliver gains if the market is efficient. According to the NPA, is the downstream industry perfectly competitive, oligopolistic, or it is an imperfect market?
4. A few large OMCs and BDCs have large market shares. This might affect the performance of the market. How is the consumer protected against
 - a. low quality
 - b. shortage
 - c. externalities, like oil spills, explosions etc.
 - d. and the profit making tendencies of the OMCs and BDCs?
5. In periods of soaring prices, especially during general elections, what strategies are put in place to protect the sustainability of the deregulation policy when
 - a. the rise in prices is due to increasing world oil prices?

GHANA

- b.** the rise is due to poor performance of the Cedis against the US Dollar?
 - c.** the rise is due to a rise in, or introduction of, taxes/levies by the Finance Ministry?
- 6. Assume a stable currency and an optimum taxation on petroleum products. How would an operational Tema Oil Refinery impact on
 - a.** petroleum pricing
 - b.** exchange rate of the Cedis
 - c.** domestic employment
 - d.** cost production for oil dependent firms
 - e.** contribution of the petroleum sector to Ghana's GDP
- 7. Certain portions of National Petroleum Act, 2005 Act 691, do not support the current full deregulation exercise.
 - a.** How does this impede the work of the NPA?
 - b.** What is the progress on the amendment of the legal framework backing the NPA?
- 8. Before the full deregulation exercise, what material challenges did the NPA face while exercising its role in the downstream market?
- 9. The full deregulation exercise was passed in June 2015. During certain periods of falling world oil prices, the Oil Marketing Companies (OMCs) and Bulk Distribution Companies (BDCs) did not reduce prices by the same measure. What factors explain this phenomenon?
- 10. Following (Q5) above, a month after the deregulation policy in 2015, the Africa Center for Energy Policy, through a press conference, realized inconsistencies and abuse of consumers by the OMCs in terms of pricing. ACEP found that the reduction in fuel prices by the OMCs was not consistent with the world oil price reduction. In such and similar situations, what sanctions are applicable?
- 11. The downstream petroleum sector contributes about 10% to Ghana's GDP (NPA, 2015). Since the full deregulation exercise was passed, what are some of the leading challenges threatening the effectiveness and sustainability of the full deregulation exercise?

GHANA

12. One of the key institutions in the sector is the NPA, the regulator of the industry. How is the NPA positioned to tackle the challenges known to the regulator?

13. Essentially, the deregulation policy is to give power back to the market players. All other factors held constant, what are some of the material benefits of having a regulator in a deregulated industry?

14. Key institutions identified in the downstream petroleum sector include the Finance Ministry, the National Petroleum Authority, the Ministry of Petroleum, and the Bank of Ghana. In what material ways do Ghanaians stand to benefit from the deregulation policy when
 - a. the NPA is strengthened?
 - b. then Finance Ministry taxes optimally?
 - c. the Central achieves a stable exchange rate?

Office of respondent.....

Signature.....

Thank you for your time and efforts.

References

- Adekanye, A. S. (1992). *Nigerian banking system in the context of policies of financial regulation and deregulation*. Nairobi: African Economic Research Consortium.
- African Centre for Energy Policy*. (2015, July 19). Retrieved from ACEP Press Statement On Petroleum Deregulation: <http://www.acepghana.com/press/66/>
- African Centre for Energy Policy*. (2015, July 16). Retrieved from Press Statement On The Reduction In The Prices Of Petroleum Products By Oil Marketing Companies.
- Alleynes, T. (2013). *Energy Subsidy Reform in Sub-Saharan Africa: Experiences and Lessons*.
- Altenkirch, C. (2013, October 17). *FitchRatings*.
- Anand Rahul, Coady David, Mohommad Adil, Vimal T., and Walsh, P. J., 2013. The Fiscal and Welfare Impacts of Reforming Fuel Subsidies in India. IMF Working Paper /13/128
- Anderson, G. (1993). *Fundamentals of Educational Research*. London. Falmer Press
- Arze del Granad, J., D. Coady and R. Gillingham (2012), "The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries", *World Development*, 40(11), pp2234-48, Elsevier.

Atingi-Ego, L. A. (2003). *Financial liberalization and its implications for the domestic financial system: The case of Uganda*. Nairobi: African Economic Research Consortium.

APEC (Asia Pacific Energy Research Centre), 1999. *APEC Energy Pricing Practices: Implications for Energy Efficiency, the Environment and Supply Infrastructure*. APEC, Japan

Bass, B. (2015, December 6). *The Definition of "Upstream" and "Downstream in the Production Process*.

Benedict Clements, D. C. (2013, January 28). *CASE STUDIES ON ENERGY SUBSIDY REFORM: LESSONS AND IMPLICATIONS*.

Borg, W.R. & Gall, M.D. (1996). *Educational Research: An Introduction*. New York. London.

Bushnell, S. B. (2000). *Electricity Restructuring: Deregulation or Reregulation?* California: University of California Energy Institute.

Burniaux, Jean-Marc, Martin, J.P., Oliveira-Martins, J., 1992. *The Effects of Existing Distortions in Energy Markets on the Costs of Policies to Reduce CO2 Emissions: Evidence from GREEN*. OECD Economic Studies, Organisation for Economic Cooperation and Development, Paris, France

Choudhri, E.U., and Hakura, D.S. (2001), "Exchange Rate Pass-Through to Domestic Prices: Does the Inflationary Environment Matter?" IMF working Paper No. 01/194

Cooke, Edgar, F.A., Sarah Hague, John Cockburn, Abdel-Ramhmen El L., and Luca Tiberti. (2014, January). "Estimating the impact on poverty of Ghana's fuel subsidy reform and a mitigating response." *Unicef Working Paper /2014/02*.

Creswell, John W. (2007). *Research Design: Qualitative and Mixed Methods Approachs*. (2nd edn.). Thousand Oaks: Sage

David Coady, Javier Arze del G., and Robert Gillingham (2010). *The Unequal Benefits of Fuel Subsidies: A Review of Evidence for Developing Countries*. IMF Working Paper /10/202

David Coady, I. P. (2015). *How Large Are Global Energy Subsidies?* Washington, D.C.: International Monetary Fund.

David Coady, M. E.-S. (2006, November). *IMF Working Paper /06/247*.

Denscombe, M. (2001). *The Good Research Guide for Small-Scale Social Projects*. Buckingham: Open University Press

Denzin, N.K and Lincoln, Y.S. (1994) *Handbook of quantitative research*. Thousand Oaks, CA: Sage

Ellig, R. C. (1997). *Economic Deregulation and Customer Choice: Lessons for the Electric Industry*. Virginia: Center for Market Processes, Inc.

Fumiko Hayashi, B. G. (2015). *Innovation, Deregulation, and the Life Cycle of a Financial Service Industry*. Kansas: International Monetary Fund.

Ghana News Agency. (2015, November 6). Retrieved from

<http://www.ghananewsagency.org/economics/government-developing-local-content-for-downstream-sector-amissah-arthur--96749>

IEA (International Energy Agency), 1999. Looking at Energy Subsidies: Getting the Prices Right. World Energy Outlook. IEA, Paris, France.

Ian Parry, D. H. (2014). *Getting Energy Prices Right : From Principle to Practice*.

Washington, DC.: International Monetary Fund.

International Monetary Fund, 2013, Energy Subsidy Reform: Lessons and Implications, forthcoming, Washington DC.

Jerome, A. (2002). *Public enterprise reform in Nigeria: Evidence from the*

telecommunications industry. Nairobi: African Economic Research Consortium.

Leedy, P.D. (1993). *Practical Research: Planning and Design*. New Jersey: Prentice Hall

Loloh, F. White (2014), "EXCHANGE RATE PASS-THROUGH IN GHANA", BoG working Paper Number 14/3, Accra, Bank of Ghana

Maree, K. (ed.). (2007) *First Steps in Research*. Pretoria: van Schaik

JoyOnline. (2015, October 13). Retrieved from

<http://www.myjoyonline.com/news/2015/october-13th/president-mahama-assures-fishermen-of-improved-living-conditions.php>

Kassey, O. (1995). *Institutional reforms and the management of exchange rate policy in Nigeria*. Nairobi: African Economic Research Consortium.

Myers, N., 1998. *Perverse Subsidies, Tax dollars Undercutting Our Economies and Environments Alike*. International Institute for Sustainable Development, Winnipeg, Manitoba, Canada R3B OY4, and Island Press, Covelo, Canada.

Ministry of Petroleum. (2015, September 15). Retrieved from MOTORISTS

<http://www.energymin.gov.gh/?p=4073>

Mwase, N. (1998). *Economic liberalisation and privatisation of agricultural marketing and input supply in Tanzania: A case study of cashew nuts*. Nairobi: African Economic Research Consortium.

Nachmias, C. and Nachmias, D. (1989). *Research Methods in the Social Sciences: Alternative Second Edition Without Statistics*. London: Edward Arnold

National Petroleum Authority. (2015, June 02). Retrieved from Govt to wash hands off pricing of petroleum products: http://npa.gov.gh/npa_new/news.php

North, D. C. (1991). Institutions. *The Journal of Economic Association*, 97-112.

Odubogun, K. (1995). *Institutional reforms and the management of exchange rate policy in Nigeria*. Nairobi: African Economic Research Consortium.

OECD (organisation for Economic Co-operation and Development), 1998. *Improving the Environment through Reducing Subsidies*. Part I and II. OECD, Paris, France.

Paintsil, P. (2015, June 15). *Breakfast & Financial Time Online*.

Patel, S. B. (2003). *Market, Regulatory Institutions, Competitiveness, and Reforms*.

Standford: STANFORD CENTER FOR INTERNATIONAL DEVELOPMENT.

Patton, M.Q. (1990). *Quantitative Evaluation and Research Methods*: Newbury Park:

Sage and Paul Chapman Publishing

Reddy, T. K. (2000). Lowering Electricity Prices through Deregulation. *Current Issues In*

Economics And Finance.

Robinson, D. A. (2012). *THE ORIGINS OF POWER, PROSPERITY, AND POVERTY:*

WHY NATIONS FAIL. New York: Crown Publishers.

Ross, R. B. (1991). *Regulation and Deregulation in Industrial Countries: Some Lessons*

for LDCs. Washington. DC: World Bank.

Ross, R. B. (1991). *Regulation and Deregulation in Industrial Countries: Some Lessons*

For LDCs. Washington. DC: World Bank.

Shurink, W.J. (1990). *Criminological Research*, in *Criminology*. Halfway House:

Southern, 97123

Stephen Bushnell, S. B. (2000). *Electricity Restructuring: Deregulation or Reregulation?*

California: University of California Energy Institute.

Stiglitz, J. E. (1989). *Markets, Market Failures, and Development*. *The American*

Economic Review, 197-203.

Taylor, Alan (2000), "Low Inflation, Pass-Through, and the Pricing Power of Firms,"
European Economic Review, Vol. 44, pp.1389-1408

Tichapondwa, S.M. (2010). Trends in Distance Education Research in Southern Africa.
In International Journal of Open and Distance Learning vol 3. pp 35-55

Thomas Tanner, A. M.-W. (2014). *Political Economy of Climate Compatible
Development: Artisanal Fisheries and Climate Change in Ghana*. Accra: Institute
for Development Studies.

Union, A. D. (2009, July 29). *Oil and Gas in Africa*.

Sarantakos, S. (2005). *Social Research Methods*. New York:Palgrave Macmillan

Zorzi, M. C., E. Hahn, and M. Sanchez (2007), "Exchange Rate Pass-Through in
Emerging Markets", ECB Working Papers Series No. 739, EU