

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

(DEPARTMENT OF ECONOMICS)



EFFECT OF THE DEREGULATION OF THE DOWNSTREAM OIL SECTOR ON PRICES  
OF PETROLEUM PRODUCTS IN GHANA

DESMOND OHENE ASANTE

DISSERTATION SUBMITTED TO THE DEPARTMENT OF ECONOMICS, COLLEGE OF  
SOCIAL SCIENCES AND HUMANITIES, KWAME NKRUMAH UNIVERSITY OF  
SCIENCE AND TECHNOLOGY IN PARTIAL FULFILLMENT OF THE REQUIREMENT  
FOR AWARD OF MASTER OF SCIENCE IN ECONOMICS

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY  
SCHOOL OF GRADUATE STUDIES

FINAL THESIS SUBMISSION FORM

POSTGRADUATE DIPLOMA, MASTER'S AND DOCTORATE DEGREE

(To be completed in Triplicate)

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8. Date of Oral Examination: JUNE 2018
9. Title of Thesis: EFFECT OF THE DEREGULATION OF THE DOWNSTREAM OIL SECTOR ON PRICES OF PETROLEUM PRODUCTS IN GHANA
10. Recommended date for submission of corrected Thesis  
14 days ☐ 30 days ☒ 60 days ☐ 90 days ☐
11. Date of Submission to Internal Supervisor: 28/11/2017  
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SUBMISSION OF THESIS: POSTGRADUATE DIPLOMA  
MASTER'S AND DOCTORATE DEGREE

(To be completed in Triplicate)

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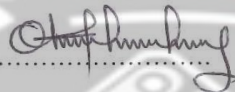
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I hereby declare that this thesis is the result of my own original towards the Master of Science Degree in Economics and that to the best of my knowledge, it neither contains material published by another person nor materials which have been accepted for the award of any other degree of the University, except where due acknowledgments have been made in the text.

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## DEDICATION

This work is dedicated to the Almighty God, for his protection and guidance. To my parents Mr. and Mrs. Ohene-Asante, my wife Mrs. Janet Ohene-Asante and my siblings for their prayers, support and guidance, I also dedicate this work to all who helped in diverse ways in making this study a success.



## ACKNOWLEDGEMENTS

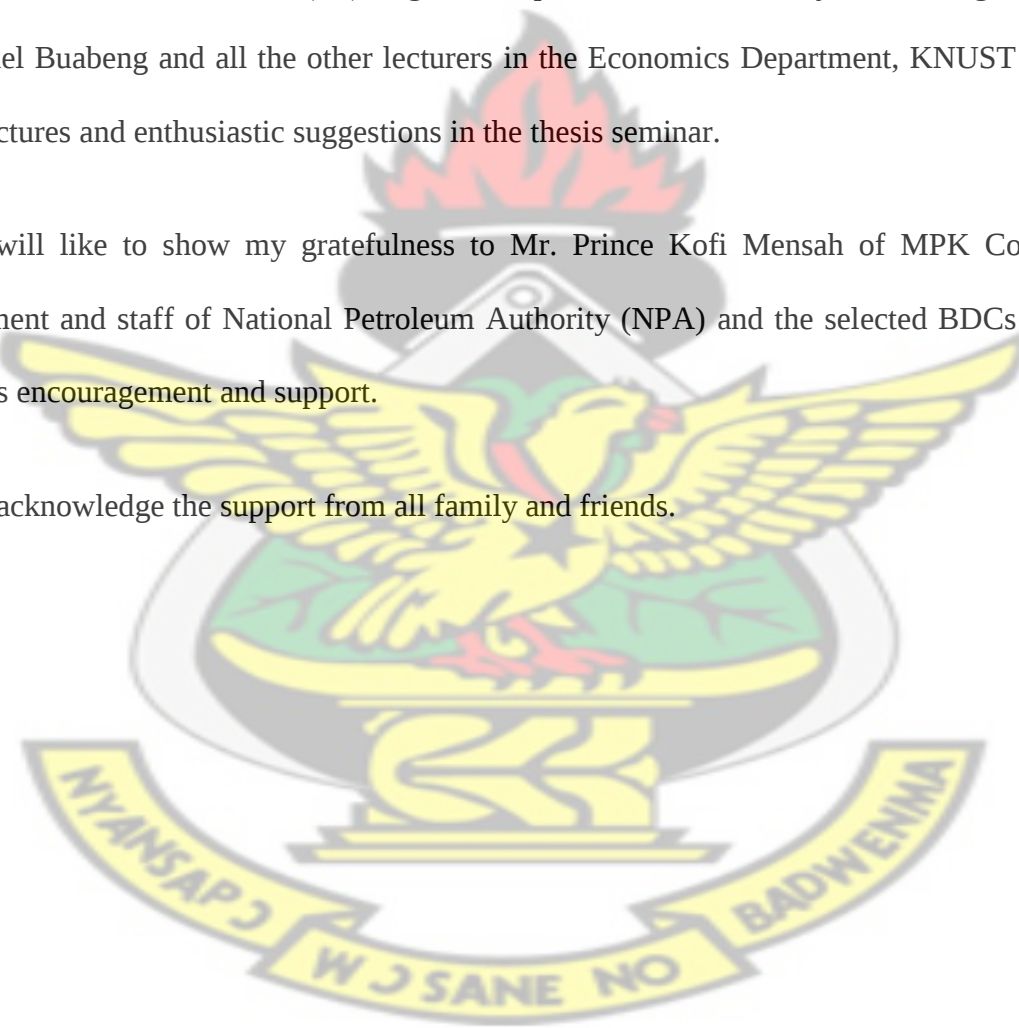
My first gratitude goes to the Almighty God who made it possible for this thesis to be a success.

My sincere and deepest appreciation and gratitude goes to Dr. A. K. Osei-Fosu, my supervisor who worked tirelessly to give me direction and guidance throughout this dissertation.

I would also like to thank Prof. (Sr.) Eugenia Amporfo, Dr. Daniel Sakyi, Dr. George Adu, Mr. Emmanuel Buabeng and all the other lecturers in the Economics Department, KNUST for their useful lectures and enthusiastic suggestions in the thesis seminar.

Also, I will like to show my gratefulness to Mr. Prince Kofi Mensah of MPK Consulting, management and staff of National Petroleum Authority (NPA) and the selected BDCs for their continues encouragement and support.

I finally acknowledge the support from all family and friends.



## ABSTRACT

The purpose of the study was to find the effect of the deregulation of downstream oil sector on prices of petroleum products in Ghana. Using the purposive random sampling, five Bulk Distribution Companies (BDCs) were selected for the analysis. The product used were Premium (Petrol) and Gas Oil (Diesel).

The study used a market structure-conduct-performance framework to analyze the industry, both before and after deregulation, as a means of judging the impact of deregulation in terms of petroleum products prices.

The independent sample t-test for both premium (petrol) and gas oil (diesel) revealed that there is a significant difference between Premium Price-Before Deregulation (PPBD) and Premium Price-After Deregulation (PPAD), at the end the null hypothesis were rejected.

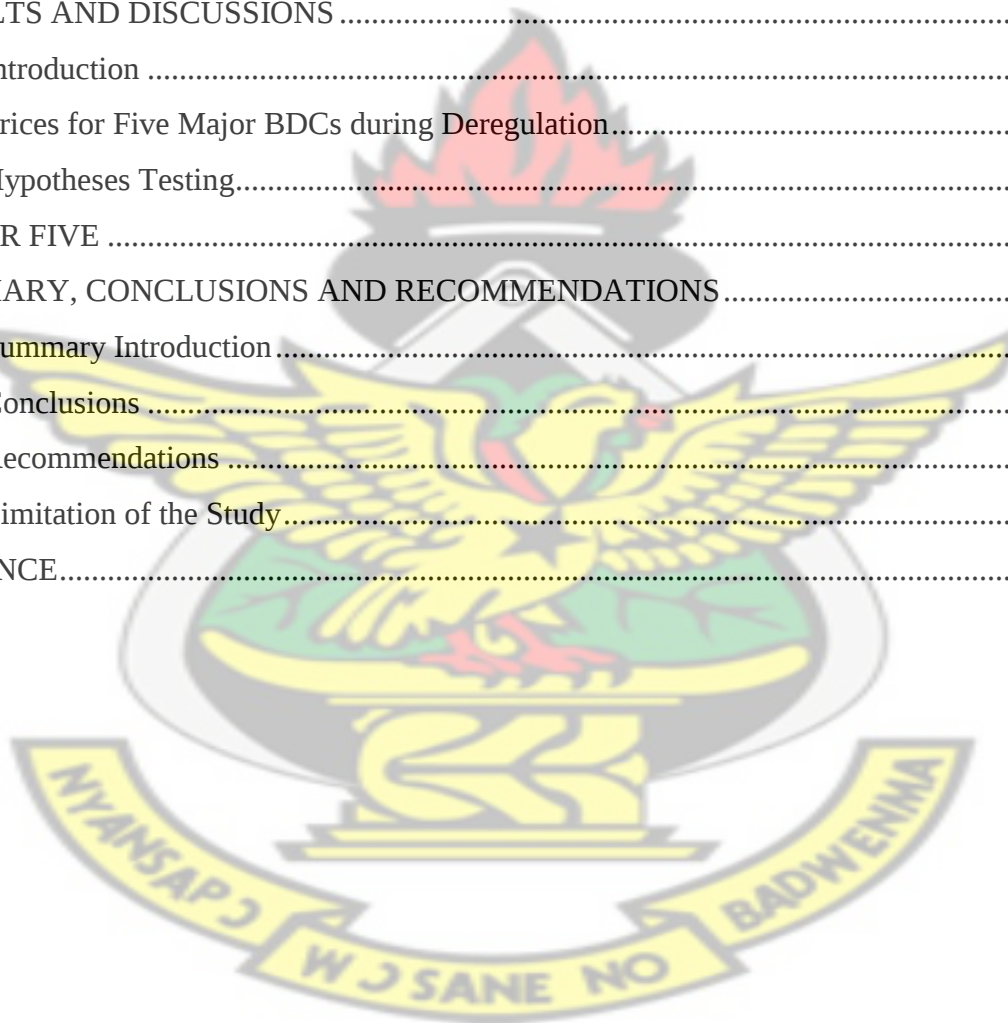
In absolute terms, prices of petroleum products after the deregulation prove to be lower compared to prices before the deregulation which means consumers of petroleum products are now enjoying some savings due to the deregulation.

There is the need for public sensitization and campaign as to well inform and educate the masses on the complete operation of the deregulation regime.

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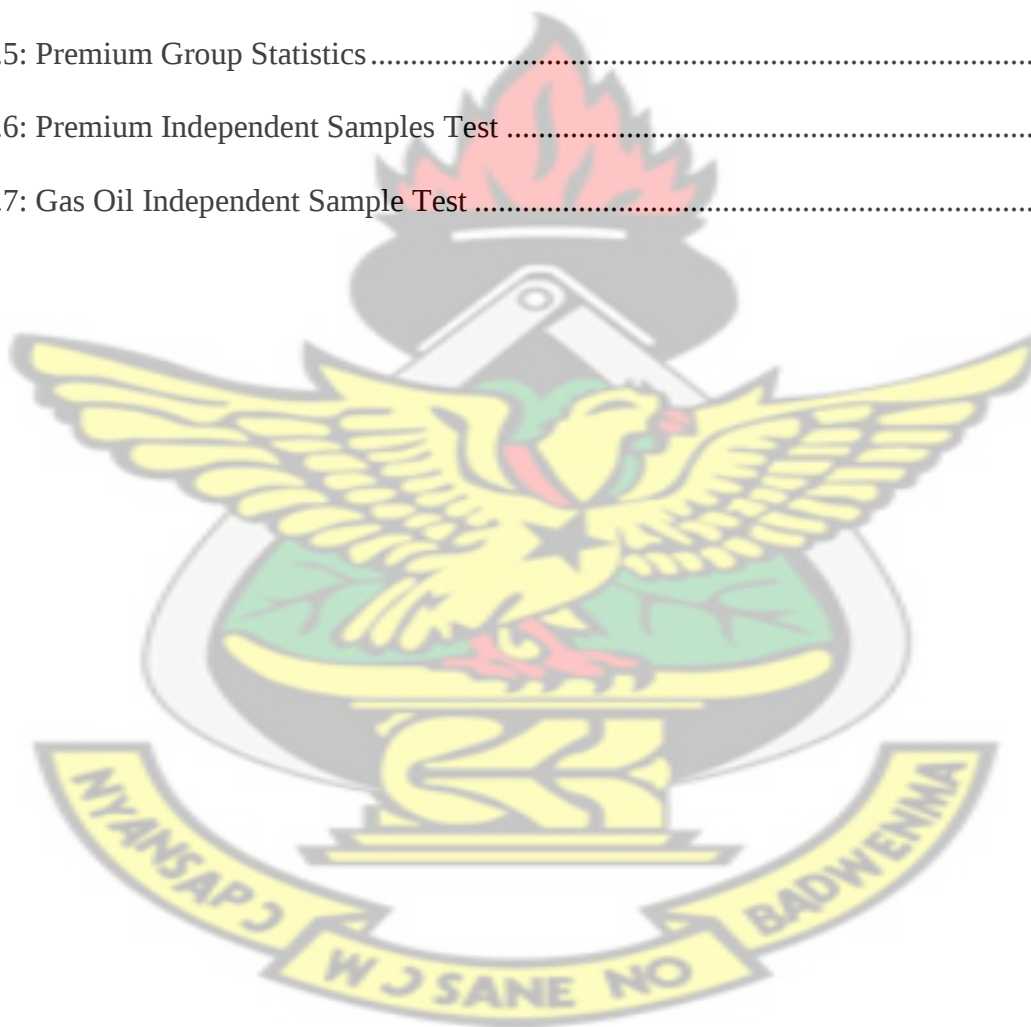
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## CHAPTER ONE

### INTRODUCTION

#### 1.1 Background to the study

It is undeniable fact that the oil sector continues to contribute tremendously to the livelihood of the common Ghanaian; household electricity consumption, heat generation, domestic transportation demand, body perfume and chemicals demand continue to soar. The broad aggregate demand for oil and associated petroleum products reached some 30 billion barrels per year on the global stage. Against this background therefore, the United States Energy Information Administration (EIA) projected that the world's energy consumption will increase by 53% by 2035 (Gruenspecht, 2011).

On a continental demand for petrol and petroleum products for the calendar year 2013, Europe and Asia accounted for 32% of energy consumption, whilst in the Middle East, it reached 53%. For South and Central America the figure was 44% whereas in North America it was 40%. The total energy consumption in Africa was 41%. (Ministry of Energy, 2010)

The petroleum consumption in the case of Ghana was projected to increase by some 5.3% annually through 2015 and beyond. In 2010 the petroleum products accounted for some 26% of total energy consumption and about 70% of Ghana's commercial energy needs. (Ministry of Energy, 2010)

The industry is usually divided into three major sectors: upstream, midstream and downstream petroleum sub-sectors.

The upstream entails exploration and production, whereas the midstream considers storage, marketing and transporting essential petroleum commodities as crude oil, natural gas, natural

gas liquids and sulphur. The last category, downstream sector, involves oil refineries, petrochemical plants, petroleum products distributors, retail outlets and natural gas distribution companies. Midstream operations are considered a part of the downstream sector.

The control of the oil sector in Ghana is under the Ghana National Petroleum Corporation (GNPC), and National Petroleum Authority (NPA). More specifically, the upstream sector is regulated by the Ghana National Petroleum Corporation (GNPC), whilst the downstream sector, is by the National Petroleum Authority (NPA).

Given the mandate of facilitating the universal access to adequate, reliable and cost effective petroleum products, the NPA thus had as its onus responsibility to regulate and monitor the downstream oil industry. Another key responsibility is to establish a Unified Petroleum Price Fund (UPPF) (National Petroleum Authority Act, 2005). All these authority was made possible by the act of parliament; NPA Act, 2005 (Act 691). (National Petroleum Authority, 2005)

A careful consideration of the objective of the Unified Petroleum Price Fund (UPPF) is the attainment of regular supply of nationwide, and more importantly ensuring that the prices of petroleum products cover the estimated cost of distribution within a well-coordinated petroleum distribution system.

## **1.2 Statement of the Problem**

Ghana's deregulation policy has as its objectives:

- removal of restrictions on the establishment and operation of facilities;
- removal of restrictions on the importation of crude oil and petroleum products; and
- removal of price controls.

Despite the Authority and industry as a whole chalking some milestones, the critical component of the 2005 regulatory reforms, which deals with full-scale deregulation through the application of a transparent automatic petroleum pricing formula for cost recovery, remains to be implemented to the latter (Amponsah & Opei, 2014).

The struck of oil in commercial quantity (BBC News, 2007) has raised speculations to the fact that prices will continue to be relatively stable. But the volatility in the price of petroleum products has had stiffer repercussions on the livelihood of most Ghanaians.

Again, the issue of deregulating the downstream oil sector has generated heated debate in Ghana with the government claiming that it will guarantee long term stability in product supply and price. They further argue that the deregulation will translate into economic growth and development. But critics, especially the organized labour claims that deregulation will lead to higher product prices, higher cost of production, and cut of jobs with a severe consequence of recession in the economy.

As a corroboration to the stands of organized labour, the Ghanaian working class have cautioned that the deregulation is never a panacea to the poor performance of the downstream oil sector.

It is therefore imperative to find out the effect of the deregulation of the downstream petroleum sector on prices of petroleum products in Ghana.

### **1.3 Objectives of the Study**

The main objective of this study is the “effect of the deregulation of downstream oil sector on prices of petroleum products in Ghana”. To arrive at the main objectives the specific objectives guided the study:

1. To examine the Petroleum Products Pricing Regime employed by National Petroleum Authority (NPA).

2. To identify the economic impact of increased prices of petroleum products as a result of the deregulation within the downstream oil sector.
3. To find out the major activities of stakeholders in the downstream oil sector in Ghana and their impact on prices of petroleum products in the domestic market

#### 1.4 Research Questions

To achieve the overall objectives of the study, the following questions were raised.

1. What is the Petroleum Products Pricing Regime employed by National Petroleum Authority (NPA)?
2. What are the economic impact of increased prices of petroleum products as a result of the deregulation within the downstream oil sector?
3. Who are the major activities of stakeholders in the downstream oil sector in Ghana and the impact on prices of petroleum products in the domestic market?

#### 1.5 Hypotheses

Null: there are no significant effect of deregulation of downstream oil sector on prices of petroleum products in Ghana.

1.  $H_0$  = There is no significant difference between Premium Price-Before Deregulation (PPBD) and Premium Price-After Deregulation (PPAD).
2.  $H_0$  = There is no significant difference between Gas Oil Price-Before Deregulation (PPBD) and Gas Oil Price-After Deregulation (PPAD).

#### 1.6 Scope of the Study

The study considered all major players within the downstream oil sector even though the oil sector has three major categorization: upstream, midstream and downstream. Contextually, only aspects of the work of major stakeholders in the downstream oil sector that is impacted by the deregulation with particular reference to petroleum prices are considered. The time

frame for assessment of the impact of deregulation on price demanded that consideration is made for the period before deregulation of the oil sector and the period thereafter.

### **1.7 Justification of the Study**

Price volatility in every market has a severe consequence on the local economy as well as the foreign engagements that may arise in international trade. Price stability is of essence. Prices in the oil sector has a direct correlation to other sectors as trade and commerce, health and the agricultural sector. To allow prices to impact negatively on the purchasing powers of the household is to destabilize the local economy. Until we understand the impact of these price fluctuations and deregulations within the economy, it is very difficult to achieve the desired growth.

The study used a market structure-conduct-performance framework to analyze the industry, both before and after deregulation, as a means of judging the impact of deregulation in terms of petroleum products prices.

The significance of this study lies in the fact that it would contribute to existing literature on the subject matter by providing an expository analysis of the pattern of increase of petroleum products prices in Ghana. The study would enhance policy formulation in the downstream oil sector with the intention of alleviating the suffering of the masses.

It would also be an invaluable tool for students, academic, institutions and individuals that want to know more about the deregulation of the downstream sector of the Ghana oil industry.

### **1.8 Organization of the Study**

The study is organized into five chapters. Chapter one gives the background to the study, the problem statement, research questions and objectives of the study, justification of the study, the scope of the study, and organization of the study.

Related literature is reviewed in Chapter two. The review covers oil sector overview, prices in the oil sector, price of petroleum products in Ghana and overview of deregulation of downstream oil sector.

Chapter three presents the methodology used for the study. Chapter four covers the methodology that was used for the research and the analysis of results of the study after the data was collected, collated and processed. Then summary of the key findings, recommendations and conclusion form chapter five.



## CHAPTER TWO

### LITERATURE REVIEW

#### 2.0 Introduction

This chapter is concerned with the review of relevant studies and literature on the subject matter. It tried to map out the trends in their arguments and stands so as to affirm or refute stands taken by previous authors and researchers alike. The literature review is built around the theoretical framework: the petroleum product pricing regime by the National Petroleum Authority (NPA), challenges of increased prices on petroleum products in Ghana, and the major stakeholders in the downstream oil sector in Ghana. Similar empirical studies are set in place.

#### 2.1 Deregulation

The general idea governing deregulation is to bolster the stands of the capitalists approach to market environment where the forces of demand and supply determines price of goods and services.

The Oxford Advanced Learners' dictionary (2005) defined deregulation as the act of freeing a trade or business outside of the rules and controls.

On broader perspective, the term deregulation concerns itself with the removal of impediments to trade; control of the movement of goods and services, thereby allowing free flow interplay of the forces of demand and supply in the determination of the price of commodities and wages of services rendered (Ojo & Adebuseyi, 1996).

The definition posited by Akinwumi et al (2005) strongly asserts that deregulation is the removal of government involvement and or interference in an existing economic system. To explain the concept better, Ekundayo, & Ajayi (2008) were of the view that deregulation

concerns itself primarily to the relaxing of government rules and regulation in the economic system with a view to unleashing the market forces of demand and supply. As a corroboration to that stands of Ekundayo, & Ajayi (2008), Fawibe (2009), believed that deregulation is the removal of government control, withdrawal of state interference, encouraging free market operation, and simplification of government's rules and regulation for greater market forces.

To further the deliberation on the subject, Ezeagba (2005), stated that the fundamental economic objective of deregulation can be summarized as bringing more competition to the market with its attendant increase in economic efficiency and welfare.

The assertion by Akintola (2005) also strongly puts the discussion in perspective. Akintola opined that deregulation is the removal of government subsidy and the cessation of the price control or regulation by officialdom. He went further to state certain conditions that may necessitate deregulation policy in a country. These conditions include the inability of government to continue to subsidize petroleum products because of competing national priorities and the need to curb smuggling of the products overseas, thereby unwittingly subsidizing other economies.

As a summary to the concept of deregulation, it can be said that deregulation is a pivotal element to promoting innovative competition in the domestic industry within a given economy. This phenomenon may promote a near monopolies ideals within an economy. However it has high tendency of opening the economy to attract both foreign and domestic investors.

A strong case for deregulation was made by Petroleum Minister, Emmanuel Armah Kofi-Buah, on a visit to the Kumasi Bulk Oil Storage and Transport (BOST) facility. He said that "Government's decision to deregulate the petroleum sector will compel oil importers and

dealers to fix their own prices at cheaper rates as buyers would want to buy from importers, whose prices are cheaper compared to others".

The price deregulation policy of the downstream oil sector took effect on June 16, 2015 with several OMCs announcing their own prices of petroleum products.

## **2.2 Brief Overview of the Petroleum Sub-Sector**

As a resource, petroleum in its natural state is vested in the President of Ghana on behalf of the citizens. This means that the exploration and exploitation of this natural resource can only be done under the sole permission of the state. Simply, only the state can grant rights for exploitation of petroleum resources pursuant to a petroleum agreement. Under article 268(1) of the Constitution, the entry into petroleum agreements for the exploration, development and production of petroleum is subject to the ratification by parliament.

Over the years different regulatory framework has been enacted to govern the broad energy sector and to an extent the petroleum sub-sector. These framework has evolved around the Petroleum (Exploration and Production) Act, 1984 (the Petroleum Law), the Ghana National Petroleum Corporation Act 1983 (Act 64), the Petroleum Income Tax Act 1987 (Act 188) (the Petroleum Income Tax Act) and the Petroleum Commission Act, 2011(Act 821).

The key institutions involved in regulating the upstream petroleum sector include the Government (through the Ministry of Energy), the Parliament of Ghana, and the Petroleum Commission.

The Ministry of Energy has a pivotal role to play when it comes to the broad energy sector. This includes policy formulation, implementation and evaluation.

The GNPC was established by the Ghana National Petroleum Act 1983 (Act 64). The primary mandate of GNPC was to undertake the exploration, development, production and disposal of petroleum. To undertake such functions in the economy, GNPC was granted certain rights enshrined in the Petroleum Act 1984 for petroleum operations. These rights amongst other things included:

- the right to conduct exploration, development and production activities over all blocks for which a petroleum agreement does not exist and to enter into petroleum agreements with third parties to conduct such activities with them;
- the right in any petroleum agreement to an option, following a declaration of commercial discovery, to acquire a percentage interest in the rights and obligations under the petroleum agreement on terms to be agreed with the applicable contractors; and
- ownership of all data and information obtained from petroleum operations.

It is now clear that with the establishment of Petroleum Commission, there is a greater liberation and space for GNPC to focus on its primary function of commercialization in the petroleum sub-sector.

The ‘Fundamental Petroleum Policy for Ghana’ was published in June 2009. Under the Petroleum Law, the Minister of Energy is also responsible for, among other things:

- granting rights to explore for, develop and produce petroleum; and
- granting consents to the transfer of rights to explore for, develop and produce petroleum.

Being instituted by Petroleum Commission Act, 2011 (Act 821), the Petroleum Commission assumed some roles and responsibility in the sub-sector. The commission's broad objective is to regulate and manage the use of petroleum resources and coordinating policies relating to them. As a key component, the Commission is to oversee the upstream petroleum sector which hitherto was under Ghana National Petroleum Corporation (GNPC), on behalf of the Ministry of Energy.

The following are the functions performed by the commission:

- ensuring compliance with health and safety and environmental standards;
- regulating petroleum operations;
- receiving applications and issuing permits for specific petroleum activities;
- promoting local content and local participation in petroleum activities; and
- assessing and approving appraisal plans.

The Petroleum Commission is under the authority of the Minister of Energy and advises on policy. The Minister of Energy is also the arbiter in any disagreement between an Operator and the Commission (before any arbitration or court process is initiated).

The broad categorisation of the petroleum sub-sector are: upstream, midstream and downstream.

- I. **upstream activities**, which involves exploration, development and production of oil and gas from oil or gas fields,
- II. **midstream activities**, which involves the transportation of oil and gas to the oil refinery or gas processing plant, and

III. **downstream activities**, which involves the refining of crude oil and distribution of the petroleum products to consumers.

With only about 60% of the national petroleum product requirement being met from domestic production at the Tema Oil Refinery (TOR), the balance of product requirements is imported. There is also the need for Ghana to build adequate capacity to enable it become not only self-sufficient in the production of petroleum products but also the “Petroleum Hub” of the West African Sub-region. This can be achieved by:

- Increasing the capacity of TOR from 45,000 BPSD to 145,000 BPSD Feasibility studies have shown that the expansion of TOR is economically justified; and
- Building new refineries. The Government has already initiated the process of building new refineries. These projects are to be fully developed and financed by the private sector. (Ministry of Energy , 2010).

In Ghana, the access to petroleum products has always not be easy. This is more serious and when it comes to the rural areas. This situation has been made so due to limited infrastructure both for storage and distribution. Since there is a high demand for petroleum product against the backdrop of limited supply, this has forced prices of both kerosene and LPG products to go higher than their official prices at rural areas. It must be stated that some considerable efforts has been made by successive governments to increase access to petroleum products particularly LPG and kerosene in rural areas.

This effort can be achieved by:

- Continuing to finance the development of rural kerosene storage and supply infrastructure nationwide. The Ministry of Energy is giving further impetus to the Rural Kerosene Promotion Programme
- Expanding the petroleum product storage capacity nationwide. BOST is currently expanding existing bulk petroleum products storage capacity.
- Expanding marine related facilities on the Volta Lake for bulk transportation to ensure year-round supply of petroleum products to Northern Ghana.
- Facilitating the availability of more petroleum product distribution outlets in deprived areas to increase access density (number of persons per sale outlet).
- Promoting a more efficient licensing regime for sales outlets to ensure optimal economic benefits to both investors and consumers
- Supporting the rehabilitation and expansion of rail infrastructure to enhance the transportation of petroleum products

The following measures will be implemented in that regard:

- Speed up the establishment of a Natural Gas Processing Plant to produce LPG from the associated gas to be produced from the Jubilee Oil and Gas Field. It is estimated that 10,000 barrels (1,340 tonnes) a day of LPG could be produced from the gas from the Jubilee Field;
- Re-capitalise GCMC to expand production capacity. The production of cylinders will focus on small sized cylinders that will be affordable to households in rural communities;

- Construct LPG Storage and supply infrastructure in all regional and district capitals in the long term. In the medium term, it is intended to develop district capital LPG infrastructure;
- Increase the LPG distribution margin. (Acheampong, 2013).

### **2.3 Petroleum Pricing Regime by the National Petroleum Authority (NPA)**

The general framework for pricing petroleum products in Ghana is built around the value chain within the petroleum sub-sector. There is an existing graded level within the pricing framework. The National Petroleum Authority (NPA) is generally responsible for the regulation of price within the Ghanaian economy. Petroleum products are imported into the country by the Bulk Distribution Companies (BDCs). Even though the importation is done by Bulk Distribution Companies (BDCs), National Petroleum Authority (NPA) ensures that there is existing a mechanism for full cost recovery, government revenue generation and a uniform price within the economy so as to ensure a sanitised petroleum sub-sector. This is done through the Unified Petroleum Price Fund (UPPF).

The first pricing metrics within the Petroleum Build up (PBU) concerns the import parity pricing (IPP) benchmark (Acheampong, 2013).

In simple terms, the IPP is the landed cost of refined fuel to Ghana. This includes the international price for refined fuel for example (Freight on Board (FOB) Price), freight charges, exchange rate, suppliers' premium, customs and port duties, insurance and losses. The BDCs who are the importers are those to bear this financial cost. The rationale behind the IPP benchmark is to have a strong relationship with the actual costs of fuel imports into Ghana taking into account global developments.

As a rule, the NPA employs a two-week sales window (1<sup>st</sup> -15<sup>th</sup> and 16<sup>th</sup>-end of each month) whereby the two-week average of the FOB prices of the products is computed using a pricing reference such as Platts. The historical average exchange rate of cedi to the dollar within the two-week timeframe is then forwarded into the equation (Platt, 2015)

Ancillary charges such as port duties are then added to arrive at the Ex-refinery price calculated in Ghana pesewas per litre. Approved taxes and levies passed by Parliament are then added along with various OMC (distribution) margins to arrive at the final Ex-pump price, which is the price the public buys fuel at the various filling stations. Fuel taxes and margins typically make up about 35-40% of ex-pump fuel prices.

According to Chamber of Bulk Oil Distributors (CBOD) which is the association of BDCs, the price build-up follows as:

A. The import price benchmarked to the world market price

- I. World market price
- II. Suppliers' premium
- III. Freight and insurance premium

B. The USD exchange rates

- I. Often 60 – 90 day forward rates (liberalized)

C. Other related cost

- I. Port charges
- II. Demurrage cost
- III. Storage cost

D. Taxes and levies

- I. Excise duty
- II. Road fund

- III. Energy fund
- IV. Energy debt recovery levy
- V. Price stabilization and recovery levy.
- VI. Special Petroleum Tax

E. Regulatory Margins

- I. BOST margin
- II. Fuel marking margin
- III. Primary distribution margin
- IV. UPPF
- V. Distribution compensation margin / promotion margin

F. Petroleum Service Providers' margins

- I. Marketers' margins
- II. Dealers' margins
- III. LPG filling plant/Premix/MGO local Admin Costs

(Chamber of Bulk Oil Distributors, 2016).

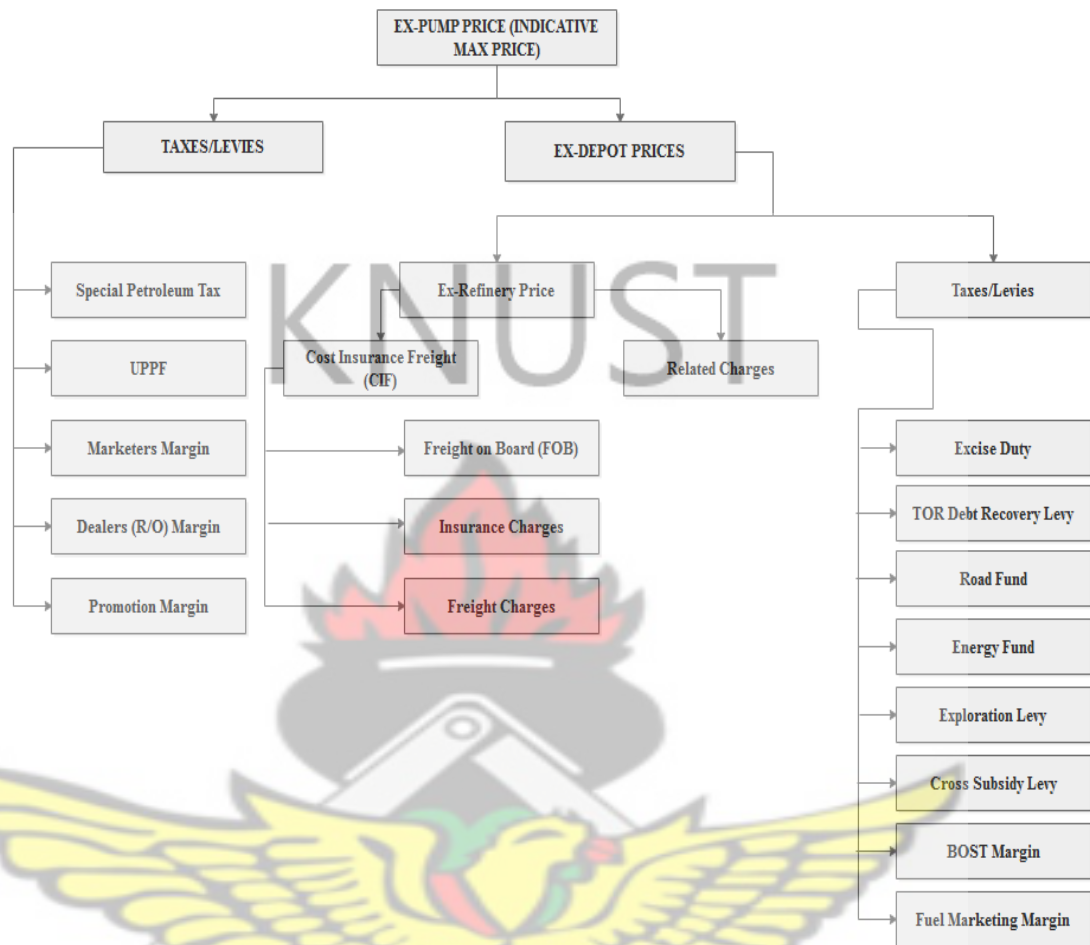


Figure 2.1: Breakdown of the Petroleum Pricing Regime in Ghana

Source: Theophilus Acheampong & Ishmael Ackah (2015).

## 2.4 Benefits of Deregulation of the Downstream Oil Sector

The institution of the deregulation of the downstream oil sector has some considerable benefits which can be looked at from the point of view of government, and the other key players in the industry. The following are key benefits that accrues to the entire economy as a result of deregulation of the downstream oil sector.

#### **2.4.1 Liberalisation of the sector for competition**

The mere event of controlling price in the market does not promote free inflow of investment. There is the tendency for potential investors to suspecting being manipulated by government out of their own expedient and whimsical gains. Given the free operation of the market forces of demand and supply, there is that liberation sort by investors in the market. Since deregulation includes the needed price liberation, it will allow for de-politicisation of the petroleum sub-sector by allowing BDCs and OMCs to operate freely in the determination of petroleum prices in the domestic market. Contrary to the Automatic Petroleum Product Pricing Formula (APPPF's) asymmetrical pricing, OMCs will adopt competitive price differentiation, thereby allowing consumers to benefit from the fall in world fuel prices.

#### **2.4.2 Reduced Administration and Management Costs by Government**

Government agencies and organisations have a duty of regulating agents and firms within their jurisdiction. Often, the government machinery is saddled with huge operational, administrative and management cost. Over the years government have sort ways to reduce such huge financial burden through appropriate strategies. One of such strategies is deregulation. In line with the deregulation of the downstream oil sector, government through the NPA is able to reduce huge administrative and management cost through the limiting of the NPAs role to ensuring quality petroleum products as against setting and regulating petroleum prices.

#### **2.4.3 Promote Competition among OMCs**

There is no denying the fact that through the open market as a result of deregulation of the petroleum sub-sector, there is an increase level of competition on the part of the OMCs to satisfy the domestic demand. The competition has a tendency to effectively pull prices of petroleum products downwards. A classic case was seen when through the deregulation Total

and Shell adjusted their prices upward only to see Goil holding its prices constant and attracting more consumers by offering lower prices. The strategy by Goil indeed was to drive upward its market share in the sector and at the same time bolster its brand loyalty and consequently become very competitive.

#### **2.4.4 Increased Efficiency of OMCs**

There is a general tendency for the deregulation to boost the efficiency level of major players in the downstream oil sector. As a result of the competition, OMCs develop the best possible and efficient ways to satisfying consumers of petroleum products in the domestic economy. This eventually lowers the cost of production for these OMCs in the country.

According to Adagba et al (2012), the rising demand for petroleum products has made deregulation in the downstream oil sector compelling for efficiency in the sector, as it would ensure increased opportunity to control business flows through integration of marketers ability to be involved in a broad range of activities from refinery to the actual sales point.

#### **2.4.5 Eliminate Subsidies**

A significant benefit that will accrue to the government and for that matter the whole economy is the elimination of subsidy in the petroleum sub-sector through the deregulation effort. Barkido (2010) stresses that the benefits of deregulation are enormous as it is meant to eradicate huge revenue spent as subsidy. As at 2015, government subsidy to the petroleum subsector accounted for some 3.2 percent of GDP (CUTS International 2015). When deregulation is successfully carried out, the economy is able to redirect such huge resource to other sectors of the economy.

It suffices to note that the subsidy regime in Ghana posed huge financial burden on the OMCs. As of 18th June, 2015, BDCs claimed that the government owed them an amount of GHc 3.4

billion which is largely due to forex exchange losses, price under recoveries, higher interest rates and fuel subsidies (Iddrisu, 2015). This situation has affected the operations of the OMCs in the country. The OMCs are not in the position to secure letters of credit from most financial institutions in their quest to import petroleum products into the country.

Another dimension of the subsidy regime is that it led to lower prices of the petroleum products which was not realistic prices in the West African sub-region. It therefore led to smuggling of fuel to neighbouring countries. While a litre of gasoline costs \$1.04 in Ghana, it costs \$1.17 and \$1.19 in Ivory Coast and Burkina Faso respectively (Iddrisu, 2015).

A finding by New Crusading Guide (2013) was evident that out of a stock of ten (10) tankers dispatched weekly from the Buipe fuel storage facility to Bakwu, only three (3) tankers get delivered, with the rest finding their way into Burkina Faso through smuggling. This the paper said could be attributed to smuggling. In short, due to the lower prices of petroleum products in the country, it opened the door for smuggling leading to huge revenue lost on the part of the country. As a result of the deregulation the door for price liberalization opens and has the tendency to bring in fair prices for the petroleum products.

In short, the drawdown on expensive subsidy policy will discourage rent-seeking behaviour and reduce illegal export of petroleum products to Ghana's neighbouring countries. This creates a disincentive for smuggling, and therefore reduces a significant loss of tax revenue to the government. (CUTS International, 2015).

#### **2.4.6 Availability of Fuel all Year round**

The deregulation of the downstream oil sector of the Ghanaian economy has the potential of providing both rural and urban consumers with petroleum products all year round. It is a fact that the price regulatory regime hitherto deprived OMCs needed financial muscle and capacity

to be competitive in the downstream market. Deregulation would create a level playing field to attract new entrants and private investors into the sector which will further broaden their scope and coverage for which rural and domestic consumers will not be deprived. Through an effective and efficient deregulation of the downstream oil sector, undue and convoluted queues at fuel pumps and shortages will be a thing of the past. The work of Barkido (2010) readily support the stands that deregulation of the downstream oil sector promotes the availability of petroleum products all over the country and no one needs to queue for days at filling stations waiting for non-existing products.

*Table 2.1 Summary of Benefits of Deregulation of the Downstream Oil Sector*

| GOVERNMENT                                                                    | OMCs                                                                                  | CONSUMERS                                                                                   |
|-------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| Saving in administration and management costs of the APPPF                    | Ability to determine prices of petroleum products                                     | Symmetrical pricing which effectively reflects the value of the cedi and world market price |
| Improvement in budget deficit                                                 | Improvement in efficiency to reduce cost of production in order to remain competitive | Lower prices of petroleum products without affecting the quality                            |
| Effective investment in social welfare programmes                             | Opportunity to increase market share in the petroleum sector                          | Improvement in socio-economic conditions due to the government's social welfare programmes  |
| Gain of tax revenue loss previously from illegal export of petroleum products |                                                                                       | Increase in choices and options                                                             |

Source: CUTS International (2015).

## 2.5 Challenges of Increased Pricing on Petroleum Products

Even though there is a high expectation of uncountable benefits accruing as a result of the deregulation of the downstream oil sector, the policy has its own associated challenges and problems.

### 2.5.1 Ineffective Competition

Notwithstanding the general notion of increased competition in the petroleum sub-sector as a result of the deregulation, this has not been readily so. Competition among the leading OMCs

has revealed the opposite. Immediately NPA transferred its responsibility of pricing petroleum products to OMCs, some leading companies in the industry took an unfair advantage of the market.

Evidently, Total and Shell both increased their prices by four percent, whereas Goil maintained its prices. Moreover, these three dominant OMCs have only lowered 15 percent reduction in the prices in the third week of July, despite 25 percent reduction in oil prices, showing their reluctance to pass benefits on to consumers (CUTS International, 2015).

### **2.5.2 Potential of Unfair Collision by OMCs**

Given huge control of petroleum price determination as a result of the deregulation, the OMCs stand the chance of adopting collusive behavioural tactics with the prime aim of exploiting the vulnerable domestic consumer. It is true that motivated by joint-profit maximisation or encouraged to reduce price and revenue instability in the sector, competitors collude on price (CUTS International, 2015). When OMCs are seen to be collaborating to hugely exploit consumers, the purpose of deregulation in the petroleum sub-sector is defeated.

### **2.5.3 No incentive to Improve OMCs operations.**

It has been argued in many quarters that with the removal of the subsidy regime, OMCs and other key players in the petroleum sub-sector are left alone to fend for themselves without any financial support from the government. This tendencies eliminates all incentive to improve OMCs efficiency and effectiveness and thus to lower cost of production.

### **2.5.4 Absence of Functional Competition Policy in Ghana**

Even though there is a projected view on the competitiveness of deregulation in the downstream oil sector, a strategic policy guidelines that is holistic and efficient is yet to be

compiled and laid out. To broaden the scope of this burden of achieving competition as a result of deregulation, there is no punitive measure to serve as a check against anticompetitive practices. It must be said that although the NPA Act 691 of 2005 has some provisions on fair trade and competition, it is uncertain whether the authority has the institutional capacity to investigate anticompetitive practices and proffer stiff punishments to the violators (CUTS International, 2015).

### **2.5.5 Huge Social Repercussion on removing Subsidy**

Since deregulation abolishes the subsidy regime, the final consumer loses the benefits that arises from the subsidy. It is the poor Ghanaian who is bound to suffer the repercussion of abolishing the subsidy regime. Again, the primary purpose of subsidy which was to benefit the poor and ensure better livelihood for the poor has always been defeated. The UNICEF report suggests that subsidy policy in Ghana primarily benefits the richest households despite its target on the poor (CUTS International, 2015). To broaden the argument further, since the value of the cedi and world market price remain constant, the complete elimination of the subsidies increases the prices of petroleum products, imposing both direct and indirect effects on household welfare (CUTS International, 2015). Household would have to spend huge sums of money on procuring petroleum products for cooking and transportation. This has resulted in huge financial burden on the household. The multiplier effects of huge prices of petroleum can be felt in the prices of domestic food stuff on the Ghanaian market. This point has been echoed by the UNICEF report. It maintains that impact of the high price of petroleum products can be felt on the poorest quintile the most.

To be more specific on the UNICEF report, it projects that the household consumption will decline by some 2.1 percent, as against other sectors experiencing between 1.56 percent and 1.86 percent decline in consumption.

To sum up therefore, the removal of subsidy in the downstream oil sector has the potential of widening the poverty levels of most Ghanaians especially the poorest. UNICEF estimates that poverty rate will increase by some 1.5 percent in Ghana. The implication is that some 395,180 will suffer greatly when as a result of the removal of subsidy in the downstream oil sector.

## **2.6 Major Stakeholders in the Downstream Oil Sector in Ghana**

The key operators and players in the oil sector in Ghana includes Ministry of Energy and Petroleum, Ghana National Petroleum Corporation (GNPC), National Petroleum Authority (NPA), Tema Oil Refinery (TOR), Bulk Oil Storage and Transportation Company Limited (BOST), Bulk Distribution Companies (BDCs), Oil Trading Companies (OTCs) and Oil Marketing Companies (OMC).

### **2.6.1 Ministry of Petroleum (MoPET)**

MoPET develops and ensures a reliable high quality energy service at the minimum cost to all sectors of the economy through the formulation, implementation, monitoring and evaluation of energy sector policies. The vision of MoPET is to secure sustainable management of Ghana's Petroleum resources for maximum welfare and material wellbeing of all Ghanaians.

To attain such vision, MoPET has enshrined its mission as; sustain and optimize the exploration, development and utilization of oil and gas endowment for the overall benefit of Ghanaians, through the initiation, formulation, coordination, monitoring and evaluation of innovative policies and programmes for the sector. (MoPET 2016)

### **2.6.2 Ghana National Petroleum Corporation (GNPC)**

The GNPC was established by the Ghana National Petroleum Act 1983 (Act 64). The vision of the corporation is to become a world-class corporation capable of making Ghana the fastest

growing destination for upstream petroleum investments in West Africa (GNPC, 2011). The primary mandate of GNPC was to undertake the exploration, development, production and disposal of petroleum. To undertake such functions in the economy, GNPC was granted certain rights enshrined in the Petroleum Act 1984 for petroleum operations. These rights amongst other things included:

- the right to conduct exploration, development and production activities over all blocks for which a petroleum agreement does not exist and to enter into petroleum agreements with third parties to conduct such activities with them;
- the right in any petroleum agreement to an option, following a declaration of commercial discovery, to acquire a percentage interest in the rights and obligations under the petroleum agreement on terms to be agreed with the applicable contractors; and
- ownership of all data and information obtained from petroleum operations.

It is now clear that with the establishment of Petroleum Commission, there is a greater liberation and space for GNPC to focus on its primary function of commercialization in the petroleum sub-sector.

### **2.6.3 National Petroleum Authority (NPA)**

The National Petroleum Authority (NPA) is a statutory agency established under the National Petroleum Authority Act, 2005 (Act 691). Among other things, the objectives and functions of the authority is to regulate, oversee and monitor activities in the petroleum downstream industry and where applicable do so in pursuance of the prescribed petroleum pricing formula. This is to ensure efficiency, growth and stakeholder satisfaction (National Petroleum Authority, 2015)

To achieve the object, the Authority is mandated to perform the following:

- a) monitor ceilings on the price of petroleum products in accordance with the prescribed petroleum pricing formula;
- b) grant licenses to applicants under this Act;
- c) maintain a register and keep records and data on licenses, petroleum products and petroleum marketing service providers;
- d) provide guidelines for petroleum marketing operations;
- e) protect the interests of consumers and petroleum service providers;
- f) monitor standards of performance and quality of the provision of petroleum services;
- g) initiate and conduct investigations into standards of quality of petroleum products offered to consumer;
- h) investigate on a regular basis the operation of petroleum service providers to ensure conformity with best practice and protocols in the petroleum downstream industry;
- i) promote fair competition amongst petroleum service providers;
- j) conduct studies relating to the economy, efficiency and effectiveness of the downstream industry;
- k) collect and compile data on
- l) international and domestic petroleum production, supply and demand,
- m) inventory of petroleum products, and
- n) pricing of petroleum products for the information of the public which the Board considers necessary for the performance of its functions;
- o) periodically review in consultation with petroleum service providers the prescribed petroleum pricing formula and publish in the Gazette the respective formula;

- p) publish in the Gazette the ex-refinery prices and ex-pump prices of petroleum products based on the prescribed petroleum pricing formula;
- q) monitor daily the import parity price of refined petroleum products and publish the price periodically in the Gazette;
- r) collaborate with relevant institutions for purposes of this ACT;
- s) oversee open and transparent international competitive bidding for the procurement of petroleum products and crude oil;
- t) approve charges for the provision of petroleum services within the downstream industry;
- u) monitor and evaluate operations of the UPP Fund established under section 62 to ensure the achievement of the object of the Fund;
- v) approve expenditure charge on the fund under this Act;
- w) publish in the Gazette user fees for monopoly infrastructure; and
- x) perform any other function that is ancillary to the object of the Authority and assigned to it under this Act.

#### **2.6.4 Tema Oil Refinery**

Tema Oil Refinery (TOR) Limited is Ghana's only refinery established in 1963 to enhance the country's economic, investment and development programs. Crude oil is used as the refinery's main raw material for production, which is usually imported from neighbouring Nigeria and transferred through pipelines to the refinery storage tanks for processing into several finished products for consumption.

The refinery is situated in Tema about 24 kilometers east of the capital, Accra. It was originally named the Ghanaian Italian Petroleum (GHAIP) Company and incorporated as a Private Limited Liability Company under the Companies Ordinance (Cap 193) on December 12, 1960.

It was 100% owned by the ENI Group (Ente Nazionale Idrocarburi) of Italy. The Government of Ghana bought all the shares of GHAIP in April 1977 and became sole shareholder. In 1990 the name was changed to the Tema Oil Refinery (TOR) (TOR 2016). Until recently, Ghana imported all of her crude oil requirements through a crude oil allocation contract which is renewable annually. Ghana's annual consumption of refined petroleum products is about 1.8 million. With increasing demand, shortfalls are covered with imports of refined products by the Bulk Oil Storage and Transportation (BOST) Company Limited and Oil Marketing Companies (OMCs) (Tema Oil Refinery, 2011).

#### **2.6.5 Bulk Oil Storage and Transportation Company Limited (BOST).**

The Bulk Oil Storage and Transportation Company Limited (BOST) was incorporated in December 1993 as a private limited liability company with the Government of Ghana as the sole shareholder. Until May 2001, BOST was responsible for the distribution of refined petroleum products from its strategic depots located throughout the country.

Additionally, BOST also holds the Natural Gas Transmission Utility License granted to it by the Ghana Energy Commission (EC) on December 19th, 2012. The NGTU as per EC Act 541, 1997, will provide transmission and interconnection services for natural gas without discrimination throughout the country (BOST 2016).

#### **2.6.6 Bulk Distribution Companies (BDCs) and Oil Trading Companies (OTCs)**

These companies have been licensed by the National Petroleum Authority (NPA) as bulk distributors. They also import crude oil, procure, store, distribute and sell petroleum products particularly to Bulk consumers. These entities also served as petroleum product suppliers in times of crisis. Additionally, the BDCs supply their products to Oil Marketing Companies who retail nationwide. The major BDCs in Ghana are Fuel trade, Cirrus, Chase, ECO, Vihama,

Springfield, Ebony, Oil channel, Peace, Blue Ocean, Hask, Firm energy, Goenergy, Juwel energy, Maranatha oil services, Misyl energy, Mobile oil energy resources Ghana, Nation services, Oiltrade, Petroleum warehouse and supplies, Rama energy, Redfins energy limited, Rhema energy, and Xf petroleum limited (National Petroleum Authority 2016).

Challenges facing BDC Industry can be said to comprise:

- Availability/Flexibility of Laycan Schedule
- Higher Premiums
- Foreign Exchange Risk, and
- Capped Margins

#### **2.6.7 Oil Marketing Companies (OMC)**

These procure and sell refined petroleum products to bulk consumers and the general public through retail outlets like fuel stations and other reselling outlets. They also supply petroleum products in times of crises with the consent of the National Petroleum Authority. Some of the major OMCs in Ghana includes Agapet Limited, AI Energy Group Limited, Alinco Oil Company Limited, Allied Oil Company Limited, AP Oil & Gas Ghana Limited, Avos Oil Company Limited

Beap Energy Ghana Limited, Benab Oil Company Limited, Bf Petroleum Limited, Bisvel Petroleum Services, Blanko Oil Company Limited, Capstone Oil Limited, Cash Oil Company Limited, Champion Oil Co. Ltd, Compass Oleum Limited, Crown Petroleum Gh. Ltd, Dukes Petroleum Company Ltd., Engen Ghana Ltd, EV. Oil Co. Ltd, Excel Oil Co. Ltd, Finest Oil, Compant Limited, Fraga Oil Gh. Ltd, Frimps Oil Co. Ltd, Frontier Oil Ghana Limited, Galaxy Oil Co. Ltd, Ghana Oil Company Limited, Glee Oil Limited, Star oil Co. Limited, Total

Petroleum Ghana Limited, GRID Petroleum Ghana Limited, Glory Oil Co. Limited, Modex Oil Co. Limited, etc (National Petroleum Authority, 2016).

## 2.7 Empirical Studies

In a study to ascertain whether subsidy provision is a fallacy or not under the presence of deregulation in the oil sector of Nigeria, Nwachukwu, and Chike, (2011) used a multiple linear regression to test hypothesis. Their findings bolstered the case that there is a significant relationship between fuel demand and fuel subsidy. Thus the presence of subsidy is a fact and not a fallacy in the Nigerian economy (Nwachukwu & Chike, 2011).

Another study that some bearing to this study is one carried out by Sani and Kouhy (2014) to ascertain the effect of the deregulation of downstream oil sector on the Gross Domestic Product (GDP) and employment in Nigeria. The use of time series data formed the secondary data. The study relied on Vector Auto Regression technique, impulse response function, variance decomposition, and Granger causality to analyze data. The study concluded that there is a strong positive relationship between variation in domestic oil price and GDP, but an initial negative impact on employment during the short-run but changed to positive in the long-run in Nigeria as a result of the deregulation (Sani & Kouhy, 2014).

Nkechi (2013) study on the implication of the full scale deregulation downstream oil sector on the Nigerian economy sampled some 1177 respondents using the simple random sampling technique. He designed a questionnaire on a Likert based and used same for the data collection in three core Niger-Delta states (Delta, Rivers and Bayelsa). The study found out that deregulation of the downstream oil sector is a good policy that was wrongly implemented in the Nigerian economy (Nkechi, 2013).

## CHAPTER THREE

### RESEARCH METHODOLOGY

#### 3.1 Introduction

In this chapter the procedure adopted for the study is described in detail. It includes the research design, population of the study, study sample, sampling procedures, the nature of research instruments, and administration of the instruments for collection of data, as well as method of analysis.

#### 3.2 Research design

This study employed a descriptive approach. The descriptive research design includes surveys and fact-finding enquiries of different kinds. The descriptive research design was chosen because this study was to ascertain the effect of the deregulation of downstream oil sector on prices of petroleum products in Ghana using five Bulk Distribution Companies (BDCs): Chase, Ebony, Fueltrade, Go and Vihamma as a case study. Thus the state of affair with regards to prices of petroleum products in the downstream oil sector due to deregulation is described by this approach. The study employs the quantitative method of data analysis using prices of petroleum products: Premium (Petrol) and Gas Oil (Diesel). The quantitative method was used because it afforded the opportunity to examine the impact of price changes over time as a result of the deregulation in the downstream oil sector.

#### 3.3 Population of the study

This study considered all BDCs in Ghana as its population. These BDCs are dully registered with the registrars General Department (RGD) and is dully recognised by the National

Petroleum Authority (NPA) and Ministry of Petroleum. As at 2016 the total number of BDCs in Ghana was 23 (MoPET 2016).

### **3.4 Study sample**

Overall five (5) BDCs were sampled for the study from the 23 BDCs in the country. The five (5) BDCs were selected because of the availability of secondary data. Some of the BDCs for technical and strategic purposes were reluctant in releasing their key pricing information even after the introductory letter from the University was presented to them as evidence of using same data for academic purposes only.

### **3.5 Sampling procedure**

This study used non-probability sampling procedure for sampling. Specifically, a purposive sampling techniques were adopted in selecting the sample units: BDCs. The purposive sampling method gave the researcher the ability to select at will and also the size and content of the sample so as to maximise the research objective while at the same time reducing the burden of time and financial cost of using all the 23 BDCs for the study (Gordon, 2011).

### **3.6 Research instrument**

Since this study relied on secondary data sources, the financial statement and prices sheet for various BDCs selected were referred to for prices of petroleum products from Chase, Ebony, Fueltrade, Go and Vihamma.

### **3.7 Data collection**

With the aid of an introductory letter from the university, data were collected from secondary sources. Prior letter was sent to the appropriate departments of the selected BDCs for their permission to use the secondary data for this study. The data collection took some three (3)

weeks. This gave the BDCs the time to go through their document and select key information requested by the researcher.

### **3.8 Method of data analysis and presentation of results**

The data collected was presented through tables and charts with the aid of Microsoft suite, and Statistical Package for Social Sciences (SPSS) software. The descriptive records in the form of frequencies and percentages were done. Again, an independent sample t-test was performed to ascertain the significant difference if any between the petroleum prices before deregulation and after deregulation.



## CHAPTER FOUR

### RESULTS AND DISCUSSIONS

#### 4.1 Introduction

The chapter considered the analysis of the secondary data collected from the selected BDCs. This data is on their prices of various petroleum products since the introduction of the deregulation in 2015. This data is presented in a tabular form. Frequencies and charts were adopted as the main statistical techniques for the interpretation and presentation of data. The student t-test was used to assess the significant difference between Price-Before-Deregulation (PBD) and Price-After-Deregulation (PAD) for both Premium (petrol) and Gas Oil (Diesel).

#### 4.2 Prices for Five Major BDCs during Deregulation

To put this study in perspective, there is need to consider the prices of some Bulk Distribution Companies (BDCs) distribution companies after the deregulation in 2015 so that same could be set against prices before deregulation. Per data from the National Petroleum Authority (NPA), there are 30 Bulk Distribution Companies (BDCs) that have obtained license to operate in Ghana (National Petroleum Authority, 2016). Using the purposive random sampling, 5 Bulk Distribution Companies (BDCs) were selected for the analysis. The product used were Premium (Petrol) and Gas Oil (Diesel).

Table 4.1: Premium (PETROL) Prices for the Period

|                | Window | Chase  | PMS(PETROL) |        |           |        | AVERAGE |
|----------------|--------|--------|-------------|--------|-----------|--------|---------|
|                |        |        | Ebony       | Vihama | Fueltrade | Go     |         |
| AUGUST,2015    | W1     | 2.1869 | 2.1623      | 2.1856 | 2.2967    | 2.1563 | 2.1976  |
|                | W2     | 2.2895 | 2.2405      | -      | -         | 2.2400 | 1.3540  |
| SEPTEMBER,2015 | W1     | 2.0598 | 1.9692      | 2.0197 | -         | 1.9788 | 1.6055  |
|                | W2     | 1.9140 | 1.8750      | -      | -         | 1.9350 | 1.1448  |
| OCTOBER,2015   | W1     | 1.7400 | 1.7080      | -      | -         | 1.7640 | 1.0424  |
|                | W2     | 1.7000 | 1.7170      | 1.6900 | -         | 1.7170 | 1.3648  |
| NOVEMBER,2015  | W1     | 1.6610 | -           | 1.6520 | -         | 1.6390 | 0.9904  |
|                | W2     | 1.7260 | -           | -      | -         | 1.6390 | 0.6730  |
| DECEMBER,2015  | W1     | 1.7260 | 1.6700      | -      | 1.5920    | 1.6450 | 1.3266  |
|                | W2     | 1.6010 | 1.6300      | -      | -         | 1.6390 | 0.9740  |
| JANUARY,2016   | W1     | 1.5400 | 1.5200      | -      | -         | 1.5190 | 0.9158  |
|                | W2     | 1.5700 | 1.5700      | 1.5570 | 1.4840    | 1.5730 | 1.5508  |
| FEBRUARY,2015  | W1     | 1.4800 | 1.4200      | 1.4860 | -         | 1.4670 | 1.1706  |
|                | W2     | 1.3950 | 1.4100      | 1.3770 | -         | 1.4210 | 1.1206  |
| MARCH,2016     | W1     | 1.3910 | 1.4300      | 1.3890 | 1.4240    | 1.3880 | 1.4044  |
|                | W2     | -      | -           | -      | -         | -      | -       |
| APRIL,2016     | W1     | 1.5440 | 1.5800      | 1.5140 | 1.5390    | 1.5310 | 1.5416  |
|                | W2     | 1.5330 | 1.5200      | 1.5060 | 1.5390    | 1.5310 | 1.5258  |
| MAY,2016       | W1     | 1.5100 | 1.5420      | 1.5400 | 1.4960    | 1.5450 | 1.5266  |
|                | W2     | 1.4920 | 1.4320      | 1.4980 | -         | 1.4790 | 1.1802  |
| JUNE,2016      | W1     | 1.4920 | 1.4320      | 1.4300 | -         | 1.4790 | 1.1666  |
|                | W2     | 1.4070 | 1.4220      | 1.3890 | -         | 1.4330 | 1.1302  |
| JULY,2016      | W1     | 1.3570 | 1.3810      | 1.3780 | -         | 1.3910 | 1.1014  |
|                | W2     | 1.3920 | 1.4310      | 1.3910 | 1.4250    | 1.3890 | 1.4056  |

Data in Table 4.1 was taken from the selected BDCs for the period under the study. The records show a fortnight window pricing spread. The windows are the regulatory timeframe for displaying prices as mandated by the National Petroleum Authority (NPA). Some of the selected companies could not provide the needed information for the period requested.

Table 4.2: Ago (Diesel) Prices for the Period

| AGO (Diesel) |    | Chase  | Ebony  | Vihama | Fueltrade | Go     | AVERAGE |
|--------------|----|--------|--------|--------|-----------|--------|---------|
| AUG.2015     | W1 | 1.9543 | 1.9626 | 1.9574 | 2.0569    | 1.9138 | 1.9690  |
|              | W2 | 1.9801 | 1.9607 | -      | 2.1562    | 1.9601 | 2.0143  |
| SEPT.2015    | W1 | 1.8280 | 1.8512 | 1.8759 | -         | 1.8197 | 1.8437  |
|              | W2 | 1.9050 | 1.8870 | -      | -         | 1.9430 | 1.9117  |
| OCT.2015     | W1 | 1.7500 | 1.7270 | -      | -         | 1.7810 | 1.7527  |
|              | W2 | 1.8100 | 1.8060 | 1.8010 | -         | 1.8050 | 1.8055  |
| NOV.2015     | W1 | 1.7800 | 1.7200 | 1.7060 | -         | 1.7200 | 1.7315  |
|              | W2 | 1.7570 | 1.7200 | -      | -         | 1.7200 | 1.7323  |
| DEC.2015     | W1 | 1.7570 | 1.6800 | -      | 1.6690    | 1.6700 | 1.6940  |
|              | W2 | 1.5610 | 1.6000 | -      | -         | 1.5900 | 1.5837  |
| JAN.2016     | W1 | 1.3880 | 1.3800 | -      | -         | 1.3790 | 1.3823  |
|              | W2 | 1.3870 | 1.3900 | 1.3860 | 1.3480    | 1.3920 | 1.3806  |
| FEB.2015     | W1 | 1.3000 | 1.2400 | -      | 1.2770    | 1.2610 | 1.2695  |
|              | W2 | 1.3160 | 1.3200 | 1.3080 | -         | 1.3010 | 1.3113  |
| MAR.2016     | W1 | -      | -      | -      | -         | -      | -       |
|              | W2 | 1.3950 | 1.4600 | 1.3940 | 1.3700    | 1.4260 | 1.4090  |
| APRIL,2016   | W1 | 1.4950 | 1.5200 | 1.4430 | 1.5000    | 1.4700 | 1.4856  |
|              | W2 | 1.4560 | 1.4500 | 1.4160 | 1.5000    | 1.4700 | 1.4584  |
| MAY,2016     | W1 | 1.3450 | 1.3820 | 1.3750 | 1.3600    | 1.3640 | 1.3652  |
|              | W2 | 1.3100 | 1.2520 | 1.2890 | -         | 1.2730 | 1.2810  |
| JUN.2016     | W1 | 1.3120 | 1.2520 | 1.2300 | -         | 1.2730 | 1.2668  |
|              | W2 | 1.3280 | 1.3320 | 1.0000 | -         | 1.3130 | 1.2433  |
| JUL.2016     | W1 | 1.3070 | 1.3210 | 1.3100 | -         | 1.2890 | 1.3068  |
|              | W2 | 1.3970 | 1.4610 | 1.3950 | 1.3710    | 1.4270 | 1.4102  |

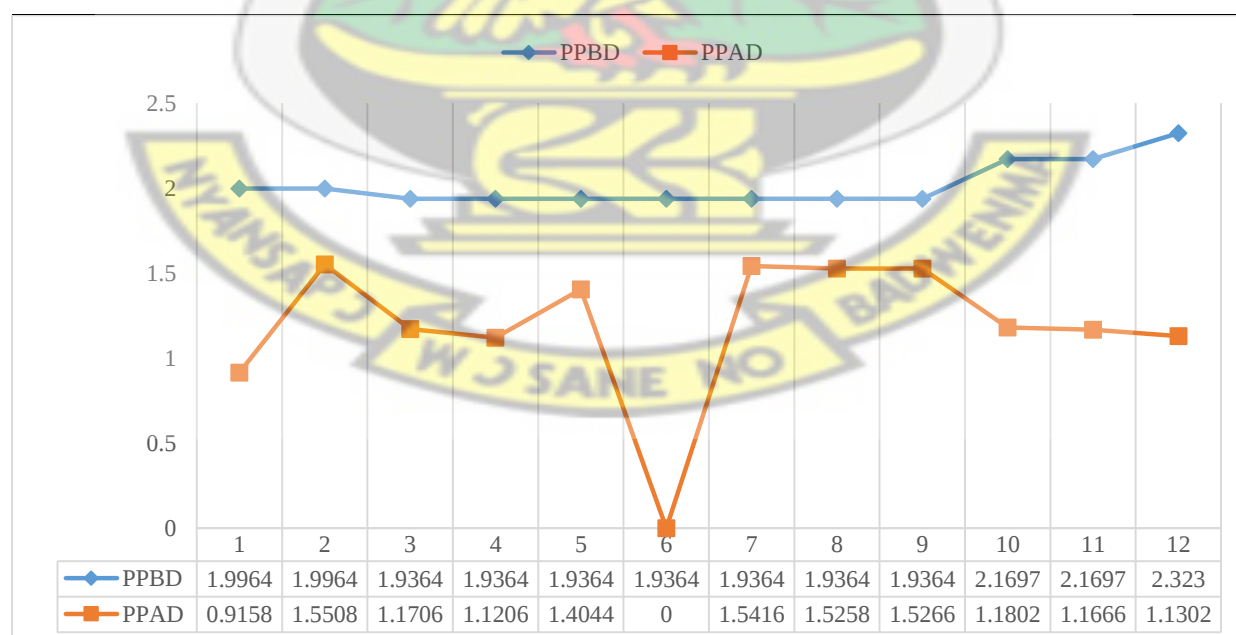


Figure 4.1: Premium price trend for two periods

A quick comparison for premium price for the period before and after deregulation in Figure 4.1 indicates a better and cheaper price trend for the final consumer after the deregulation. Whereas the average price for premium before the deregulation for selected firms stood at 1.9964 pesewa per litre, it reduced to some 0.9158 pesewa for subsequent window in the following year. Over time, the prices after the deregulation continues to be lower. This is a huge relief for all persons trading in the petroleum industry: households and corporations.



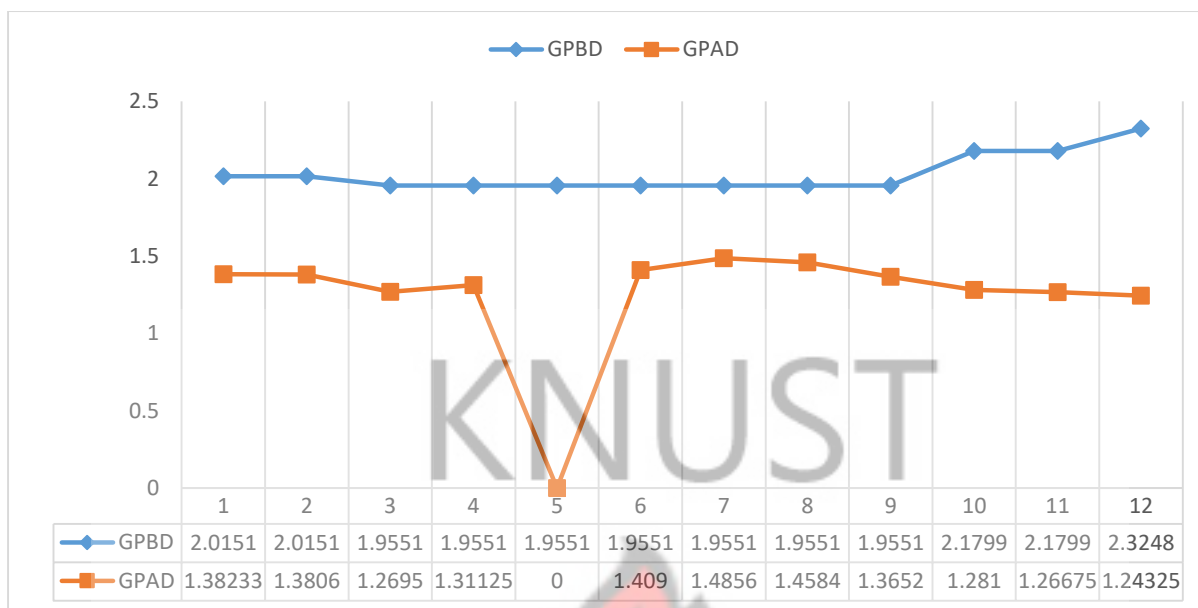


Figure 4.2: Gas oil price trend for two periods

In the case of Ago (Diesel), it is clear from Figure 4.2 that the impact of the deregulation is being felt in the market. The downward trend in pricing as a result of the deregulation is being felt by those dealing directly in diesel products. Even at the last window where Diesel stood at GH¢2.3248 for period before deregulation, it reached a reduced price rate of GH¢1.24325 after the deregulation. Again, there is a cost savings for those industry players within the downstream oil subsector. The needed competition among the BDCs continues to impact on prices for the benefit of the final consumer as suggested by the object of deregulation.

Table 4.3: Means and Standard Deviations for Premium and Gas Oil

|      | PPBD     | PPAD   | GPBD     | GPAD     |
|------|----------|--------|----------|----------|
| MEAN | 2.0175   | 1.1861 | 2.033375 | 1.23774  |
| SD   | 0.130241 | 0.4292 | 0.124836 | 0.397512 |

Table 4.3 presents a summary of the relationship and the trend for both premium and gas oil for the period earlier mentioned (Table 4.1 and Table 4.2 respectively). The average price of premium for PPBD ( $M=2.0175$ ,  $SD=0.1302$ ) is greater than the premium price for PPAD ( $M=1.1861$ ,  $SD=0.4292$ ). This clearly shows that the introduction of deregulation has served some purpose in bringing prices down for premium. However, a further analysis in comparing means is undertaken in subsequent subheadings. From Figure 4.1 too, the case for a favorable price under the deregulation is seen.

In the case of Gas oil from Table 4.3, the average price for GPBD ( $M=2.0333$ ,  $SD=0.1248$ ) is greater than the average price for GPAD ( $M=1.2377$ ,  $SD=0.3975$ ). This also agrees with the earlier assertion made. Thus, price in deregulation period is favouring the final consumer through reduced prices compared to periods before deregulation.

#### 4.3 Hypotheses Testing

The general hypothesis for this study was that there is no significant difference between price of petroleum product in periods before deregulation and period after deregulation. To position the study in specific terms, two products were considered. It was thus conjectured that:

1.  $H_0$  = There is no significant difference between Premium Price-Before Deregulation (PPBD) and Premium Price-After Deregulation (PPAD).
2.  $H_0$  = There is no significant difference between Gas Oil Price-Before Deregulation (GPBD) and Gas Oil Price-After Deregulation (GPAD).

### 4.3.1 Hypothesis 1

Table 4.4: Premium Group Statistics

| Group Statistics |            |    |            |                |                 |
|------------------|------------|----|------------|----------------|-----------------|
|                  | PRICE_TYPE | N  | Mean       | Std. Deviation | Std. Error Mean |
| PREMIUM          | PPBD       | 12 | 2.017500E0 | .1302413       | .0375974        |
|                  | PPAD       | 12 | 1.186100E0 | .4292004       | .1238995        |

Table 4.5: Premium Independent Samples Test

| Levene's Test for Equality of Variances<br>t-test for Equality of Means |       |      |       |        |                 |           |                 |                                           |         |
|-------------------------------------------------------------------------|-------|------|-------|--------|-----------------|-----------|-----------------|-------------------------------------------|---------|
|                                                                         |       |      |       |        |                 |           |                 | 95% Confidence Interval of the Difference |         |
|                                                                         | F     | Sig. | T     | df     | Sig. (2-tailed) | Mean Dif. | Std. Error Dif. | Lower                                     | Upper   |
| Equal variances assumed                                                 | 3.070 | .094 | 6.421 | 22     | .000            | .8314000  | .1294784        | .562878                                   | 1.09992 |
| Equal variances not assumed                                             |       |      | 6.421 | 13.009 | .000            | .8314000  | .1294784        | .551698                                   | 1.11110 |

The Premium Price-Before Deregulation (PPBD) (N=12) was associated with a Mean of M=2.0175 (SD=0.1302). In comparison to PPAD, the Mean was M=1.1861 (SD=0.4292). To test the hypothesis “there is no significant difference between Premium Price-Before Deregulation (PPBD) and Premium Price-After Deregulation (PPAD),” an independent sample t-test was performed. The assumption of homogeneity of variance which is a required condition was satisfied using the Levene’s F test,  $F(22)=3.070$ ,  $p=.094$  (Schmider, Zigler, Danay, Beyer, & Buhner, 2010).

The independent samples t-test was associated with a significant difference,  $t(22)=6.421$ ,  $p=.001$ . Thus Premium Price-Before Deregulation (PPBD) was associated with a significantly

larger mean than Premium Price-After Deregulation (PPAD). This therefore clearly depict the impact of the deregulation in the pricing of premium in the downstream oil sector in Ghana. A typical example of such price decrease occurred in April 6, 2016. The price of premium in the downstream decreased by 2%. The Chief Executive of the National Petroleum Authority, Moses Asaga, confirmed this phenomenon and attributed same to other factors as the stability in the cedi and more importantly on the forces of demand and supply. He stressed that there was more stock (supply) than demand depicting the notional forces of demand and supply which is felt in the deregulation regime (Citi Fm, 2016).

### 4.3.2 Hypothesis 2

Table 4.6 Gas Oil Group Statistics

| Group Statistics |          |    |            |                |                 |
|------------------|----------|----|------------|----------------|-----------------|
|                  | PRICE_TY | N  | Mean       | Std. Deviation | Std. Error Mean |
| GAS_OIL          | GPBD     | 12 | 2.033375E0 | .1248361       | .0360371        |
|                  | GPAD     | 12 | 1.237750E0 | .3975121       | .1147519        |

Table 4.7: Gas Oil Independent Sample Test

|                             |  | Levene's Test for Equality of Variances |      |       |        | t-test for Equality of Means |           |                 |                                                          |
|-----------------------------|--|-----------------------------------------|------|-------|--------|------------------------------|-----------|-----------------|----------------------------------------------------------|
|                             |  | F                                       | Sig. | t     | Df     | Sig. (2-tailed)              | Mean Dif. | Std. Error Dif. | 95% Confidence Interval of the Difference<br>Lower Upper |
| Equal variances assumed     |  | 1.218                                   | .282 | 6.615 | 22     | .000                         | .7956250  | .1202774        | .5461849 1.0450651                                       |
| Equal variances not assumed |  |                                         |      | 6.615 | 13.149 | .000                         | .7956250  | .1202774        | .5360800 1.0551700                                       |

From Table 4.6, it can be observed that the Gas Oil Price-Before Deregulation (GPBD) (N=12) was associated with a Mean of  $M=2.03$ , ( $SD=0.1248$ ). On the contrary, the Gas Oil Price-After Deregulation (GPAD) (N=12) had a mean of  $M=1.24$  ( $SD=0.3975$ ). To test the hypothesis for the above relation; there is no significant difference between Gas Oil Price-Before Deregulation (GPBD) and Gas oil Price-After Deregulation (GPAD), an independent sample t-test was performed. First the assumption of homogeneity of variance was checked using the Levene's F-test. The Leven's test revealed an F test,  $F(22) = 1.218$ ,  $p=0.282$  which is greater than the generally accepted levels of  $p>0.05$  for homogeneity of variance assumption to be observed (Schmider, Zigler, Danay, Beyer, & Buhner, 2010).

Evidently, the independent sample t-test indicated a significant difference,  $t(22)=6.615$ ,  $p=.001$ . In other words, it can be stated that Gas oil Price-After Deregulation (GPAD) had much lesser mean score (gas oil price) than Gas oil Price-Before Deregulation (GPBD), and thus the difference was significant. The reduction of petroleum product prices in April in the aforementioned for Gas oil was 4% while other product not covered in this study was 9%. A general claim for driving the deregulation gender to harnessing the full benefits in the downstream oil subsector is made by Moses Asaga, when he said the market need not be closed but opened for competition so that both customers and competition will determine the price of these commodities in the market (Citi Fm, 2016).

## CHAPTER FIVE

### SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

#### 5.1 Summary Introduction

The analysis of independent sample t-test for premium (petrol) revealed that there is a significant difference between Premium Price-Before Deregulation (PPBD) and Premium Price-After Deregulation (PPAD). The average price for Premium Price-After Deregulation (PPAD) turned out to be lower than Premium Price-Before Deregulation (PPBD),  $t(22)=6.421$ ,  $p=.001$ ). Thus the null hypothesis that there is no significant difference between Premium Price-Before Deregulation (PPBD) and Premium Price-After Deregulation (PPAD) was rejected.

On the other hand, the analysis of independent sample t-test for gas oil (diesel) also revealed that there is a significant difference between Gas Oil Price-Before Deregulation (GPBD) and Gas Oil Price-After Deregulation (GPAD). The average price for Gas Oil Price-Before Deregulation (GPBD) was lower than Gas Oil Price-After Deregulation (GPAD),  $t(22)=6.615$ ,  $p=.001$ ). Thus the null hypothesis that there is no significant difference between Gas Oil Price-Before Deregulation (GPBD) and Gas Oil Price-After Deregulation (GPAD) was also rejected. There was therefore the general indication that price of petroleum products was significantly influenced by the deregulation in the downstream oil subsector.

#### 5.2 Conclusions

The study aimed at assessing the effect of the deregulation of downstream oil sector on prices of petroleum products in Ghana. It tried to study the petroleum product prices of some selected Bulk Distribution Companies in the oil subsector. The anticipation by many Ghanaians and corporate players in the downstream oil sector was that the deregulation will drive competition

in the industry and further impact on pricing to the benefits of the final consumer. Again, argument in support of lower pricing is the striking of oil in commercial quantity. But the volatility in the price of petroleum products has had stiffer repercussions on the livelihood of most Ghanaians. This meant the implementation of the downstream deregulation was needful to alleviate the burden of higher pricing of petroleum products.

This study was largely a case study of selected BDCs in Ghana. It used the non-probability sampling method is selecting the unit of observation. Specifically, the purposive sampling technique was used to select five BDCs in the country. Using secondary data from five (5) selected BDCs in Ghana, an independent sample t-test was performed on petroleum product prices (Petrol and Diesel) for the period before deregulation and the period after deregulation. Using the petroleum products proxies as Petrol and Diesel, the study found there was a significant difference between the prices of the proxies before the deregulation and after the deregulation. In absolute terms, prices of petroleum products after the deregulation prove to be lower compared to prices before the deregulation. This meant that the household and businesses enjoy some degree of cost savings as a result of the deregulation just as predicted.

### 5.3 Recommendations

The benefits of deregulation lies in the capacity of physical structure as well as the effectiveness of the administrative structure of the country for implementation. Without this, it is difficult to harness the full benefit of this liberalisation effort.

- First, the need for public sensitization and campaign as to well inform and educate the masses on the complete operation of the deregulation regime. This will help both consumers and importers of petroleum products to operate in an open competitive

economy devoid of information asymmetry. This will reduce or avoid the effect of mitigation unnecessary social unrest and agitations.

- One the price of petroleum products fluctuates in the world market, the domestic prices are bound to vary from time to time. This should not be considered as a failure of the deregulation to maintain prices down for the entire economy. Businesses and economic analysts should seize the opportunity to clearly define the demography and the buying patterns of consumers of petroleum products: thus, consumers' elasticity of demand for petroleum products will be determined as well as establishing appropriate policies.
- The domestic tax regime on petroleum products needs to be looked at. In the haze of world economic pressure and price fluctuation, the arbitrary imposition of tax will only limit full private sector participation in the sector with dire consequence to the populace.
- The government should rather consider the reduction of petroleum taxes to create a more fiscally relaxed economy attracting and encouraging the private sector to advance more capital for the sector. This will result in lower prices and thus propel the entire economy for growth and development.
- It is evident that Ghana is battling the issue of instability and slowdown of economic growth given the downturn in oil prices. The hedging program adopted by Ghana needs to be strengthened so as to mitigate the risks associated with future oil price swings. The idea posited for the setting up of a Mitigating Fund is laudable. This will provide a fiscal buffer in times of skyrocketing world oil prices.
- There is the need to build strategic reserves in the petroleum sector as anticipated future increases in oil prices. The building of underground storage tanks across the country will position Ghana to take advantage of shortages in supply. This has been the practice

in developed economies as USA, Russia, China and more currently now in South Africa.

It is recommended that further studies should consider “the deregulation price effect on the consumption patterns of petroleum products between the different economic classes, and between public and private sector institutions.

#### 5.4 Limitation of the Study

There was a genuine case of a difficulty on the researcher while in the process of data collection. This was as a result of the vast spread of major stakeholders in the downstream oil sector in Ghana who constituted the sample used.

Moreover, time for the research was a challenge. The degree to which the researcher had to blend corporate hours and research time presented a serious challenge. This notwithstanding, the quality of the research was not compromised since an efficient and strategic timelessness was set for data collection, and analysis.

There was the tendency for respondents to exaggerate and to a larger extent distort company facts impeded the effort to generalize the findings. Despite these limitations to the study, it was carried out diligently to make it representative and useful for the purpose for which it was conducted.

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