

Assessment Of Petroleum Price Deregulation On The Performance Of Selected Oil Marketing Companies In Ghana

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ABSTRACT

This study examined the factors that influence petroleum products pricing under deregulated regime; determine the effect on the performance of Oil Marketing Companies; and also explore the challenges Oil Marketing Companies (OMCs) face under the deregulated regime of petroleum products pricing in Ghana. The study employed a survey methodology using questionnaires to collect information from some decision making staff of OMC across the country. Mean scores and regression techniques were applied to provide answers to the research questions. The study established that internal factors influenced prices more than external factors under deregulation. External factors also become more influential when the influence of OPEC foreign policies is taken out of the equation due to the high standard deviation in responses. The study also found that petroleum price deregulation has a significant positive effect on the performance of OMCs in Ghana. The study finally established that, while OMCs performance is positively influenced under petroleum price deregulation, OMCs however face a number of challenges under the deregulated regime. Challenges such as macroeconomic conditions, black market activities, high operational costs; competition among OMCs; and then inability of OMCs to expand infrastructure were the notable ones. The study recommended that government puts in effective macroeconomic policies to stabilise macroeconomic conditions like the exchange rate, reserve stock and financial interest by banks. OMCs without adequate capacity must seek strategic assistance and advice to prevent their collapse now because the price competition will certainly not spare weaker OMCs.

KEY WORDS: *Deregulation, Oil marketing, Oil marketing companies, Oil pricing*

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I. BACKGROUND TO THE STUDY

Every country's development depends on its energy policy strength, which affects, among others, economic and technological development. Commercial sources of energy such as petroleum, coal and natural gas, as well as hydroelectrical, biomass, nuclear, geothermal, wind and tidal power are meeting these countries' energy requirements (Munasinghe & Schramm, 1983). Due to its importance and need for oil products, the pricing of petroleum products is a concern for governments and civil society organizations (Ayres & Warr, 2009). Relationship between international crude oil price changes and the macro-economy of various countries have been widely studied. Macroeconomic theory predicts that a positive oil price shock raises price levels and decreases production in an oil importing country. A negative shock is likely to move the price and output in the opposite direction. The severity of the impact of oil price shocks are thought to be moderated by regulating domestic prices of petroleum products in the oil importing country (Bose, 2017). The implication of regulating oil price in a domestic country includes introducing a market economy, increasing economic efficiency, establishing democracy and guaranteeing political freedom as well as increasing government revenue (Dhaji & Milanovic, 1991). Its effects on the local oil prayers is that it will reduce the cost government spends on subsidizing the sector which runs as high as 1.5 billion cedi's annually, which can consequently be used to handle socio- economic and welfare needs of the Ghanaian people (Awudi, 2015).

Petroleum Price Regulation gave way to Price Deregulation (Automatic Petroleum Product Pricing Formula-APPPF) in mid-June 2015 (Awudi, 2015). Two of the major factors that influence prices of fuel at the pumps in Ghana include world market price of crude and the exchange rate of the Ghana cedi to the USD. In the past, Government through the industry regulator (National petroleum Authority-NPA) regulate the pricing of petroleum products to ensure consumers are protected from the market forces by absorbing some increments as subsidy. However, subsidy costs absorbed by Governments over the years were not redeemed on time to free up cash for the Bulk Distribution Companies-BDCs (with Tema Oil Refinery as a major casualty) to operate efficiently. This led to intermittent shortages of the products on the market because banks were reluctant to issue Letters of Credit to guarantee the importations of the products into the country, difficulty for the downstream oil providers to compete favourably in the market, both in terms of pricing and quality (OECD, 2013). The Price

Deregulation allows the OMCs to negotiate with the BDCs to arrive at competitive prices. It therefore means that Marketers Margin is no longer being determined by the National petroleum Authority (NPA). OMCs with stronger bargaining power are leveraging to get good margin from BDCs to be able to sell at lower prices at the pumps. OMCs which have integrated with BDCs are enjoying economies of scales and managing their Working Capitals to price lower at the pumps (Skaten, 2017).

Statement of the Problem

Petroleum Price Regulation gave way to Price Deregulation [(Automatic Petroleum Product Pricing Formula-(APPPF)] in mid-June 2015. Although there were extensive debates about the merits and demerits by industry players, economists, pressure groups, political and social commentators for over a decade it became quite clear that some key stakeholders were not adequately equipped before the implementation of the APPPF. Price standardization and ceiling by the National Petroleum Authority (NPA) over the years has protected final consumers from the sharp damaging effects petroleum products would have had on the economy and other financial effects at large. It challenges by government inability to pay off subsidies brought about a deregulated petroleum pricing regime.

Deregulation of petroleum prices allows for OMCs to have the freedom to price their products in line with international prices. When world market prices go up, OMCs are free to also increase the prices of their products in response. Not all OMCs however respond immediately to international price changes in oil. Petroleum price deregulation therefore leads to price competition among Oil Marketing Companies (OMCs) (Awudi, 2015). To engage in price competition, a firm requires adequate capacity to lower its prices (Drouhin, 2018). Without capacity, OMCs are likely to record losses. OMCs who do not lower their prices in tune with the competition lose sales. In addition the deregulation process in Ghana is defined as a cautious success by Amponsah and Opei (2017), all the objectives having been largely achieved except for the goal of price decontrol. It is adjusted so that all downstream investors can recover their costs fully, while taking the price of petroleum products into account. The government control of the import and the establishment and operation of crude oil and petroleum products have been reduced to an underlying regulatory role, which is only present in order to guarantee a healthy environment and allow market forces to work. As mandated by the petroleum downstream industry, the National Petroleum Authority (NPA) shall control, track and monitor downstream petroleum industry activities; create a Unified Petroleum Price Fund (UPPF) and provide for related purposes. Again, the NPA ensures complete cost recovery, the generation of government revenue and price uniformity by means of the Unified Petroleum Price Fund (UNPF). The impact on the market of the NPA operations would eliminate the state-owned company's natural monopoly through privatization and deregulation of price controls; and build downstream competition by allowing more companies to become active and eventually to deliver to the consumer at competitive prices. Literature on deregulation of petroleum prices has however overlooked the effect of deregulation of the financial performance of OMCs. (Awudi, 2015). It is for this reason that this research is conducted to assess the effect of petroleum price deregulation on the performance of OMCs.

Objectives of the Study

The main objective of this study is to investigate the effect of petroleum price deregulation on the financial performance of OMCs in Ghana. Specifically, the study seeks to achieve the following objectives:

- i. To examine the factors influencing petroleum pricing in a deregulated oil market in Ghana
- ii. To assess the effect of deregulation on the performance of oil marketing companies in Ghana.

Research Questions

To achieve these objectives, the following questions would be answered:

- i. What are the factors that influence petroleum price deregulation in Ghana?
- ii. What is the effect of petroleum price deregulation on the financial performance of selected OMCs in Ghana?

Significance of the Study

The findings of the study would highlight the effect of deregulation on the performance of OMCs. The outcome of this study would also serve as a data base for further researchers in this field of research. As a result, the deregulation is expected to promote competition, offering lower prices of petroleum products to consumers in Ghana as well as improving efficiency of the petroleum industry. This study therefore finds out whether these expectations have been met since the deregulation in 2016.

Scope of the Study

OMCs were selected purposefully on the criteria that they were in existence before the deregulation came into place and are still operating within the deregulation, thus they will be in a better position to explain the effect of

deregulation on performance of OMCs. Further, participants from the selected OMCs were also purposefully selected based on the criteria of knowledge of deregulation and their country-wide operation.

II. LITERATURE REVIEW

2.1 Conceptual Review

The conceptual review for this paper focuses on the factors that influence petroleum pricing in a deregulated market and how it impacts the performance of OMCs.

2.1.1 The Concept of Deregulation

In common words, deregulation means the abolition of financial and commercial controls, as Ernest and Young point out that deregulation and privatization are components of economic reform initiatives aimed at improving the overall economy properly (Ernest and Young, 1988). For instance, relieving government from on-going financing of large-scale public infrastructure programs by selling public companies; promoting productivity and quality in the use of resources; decreasing government borrowing while raising revenue; encouraging healthy competition in markets in a free market environment; increasing investment returns. In other words, economic deregulation means freedom from the control of the government (Rice & Patrick, 2008). To Akinwumi et al. (2005) deregulation is the elimination of government interference with the operation of a system. Also to Nkechi (2013), that in order to ensure the system's own optimum level through the forces of supply and demand, the rules and regulations of government governing the system's operations are relaxed or maintained. This refers to private involvement in the economic activities of a country.

It must guarantee a dynamic, monopoly-free economic system that enables the economy's demand and supply process to prevail. In order to achieve this goal, market factors are given greater role compared with rigid government regulation (Abudu & Sai, 2020). It aims to stabilize and restructure the economy to achieve sustainable development. Ayodele acknowledges and maintains that deregulation is a fundamental feature of price and market reforms, which includes two basic assumptions: the freedom of growth in the private sector through the removal of public constraints on private economic activity. Secondly, the divestment of government assets into private hands, in particular public companies (PEs) (Akosa, 2016). To Dhaji and Milanovic (1991) has the prospects of ensuring: the implementation of a market economy; increasing economic efficiency; developed democracy and political freedom guaranteed; as well as raising government revenue. According to neoliberalists, deregulation is intended to take advantage of the market and competition systems: production, profitability and efficient operation, in accordance with the values of private companies (privatization), which is, increasing market forces through a degree of deregulation, economic liberalisation, reduction of wages and price controls (Okarah, 2012). Okarah further argues that in the political economy of countries, especially Low Developing Countries seeking World Bank or IMF assistance, privatisation and deregulation are now a suitable paradigm. The presumption of the private sector's intrinsic productivity should be called into question. In Ghana, many of the income of the private sector are not necessarily due to efficient activity and higher profitability, but instead are always the money earned by private contractors through inflation, hiring, corruption, and power relations with the public sector (Amponsah & Opei, 2017). Private sector efficiency and incomes have therefore been questionable.

2.1.1.1 Conceptual framework

The Figure 1 illustrates the conceptual framework on the study. The expectation is that given the factors that influence deregulation and the policy deregulation itself, the performance of the OMCs may be affected significantly. The dependent variable was the petroleum deregulation of the oil marketing firms in Ghana. The independent variables were factors influencing petroleum price, challenges in petroleum price deregulation and effect of price deregulation on OMC's.

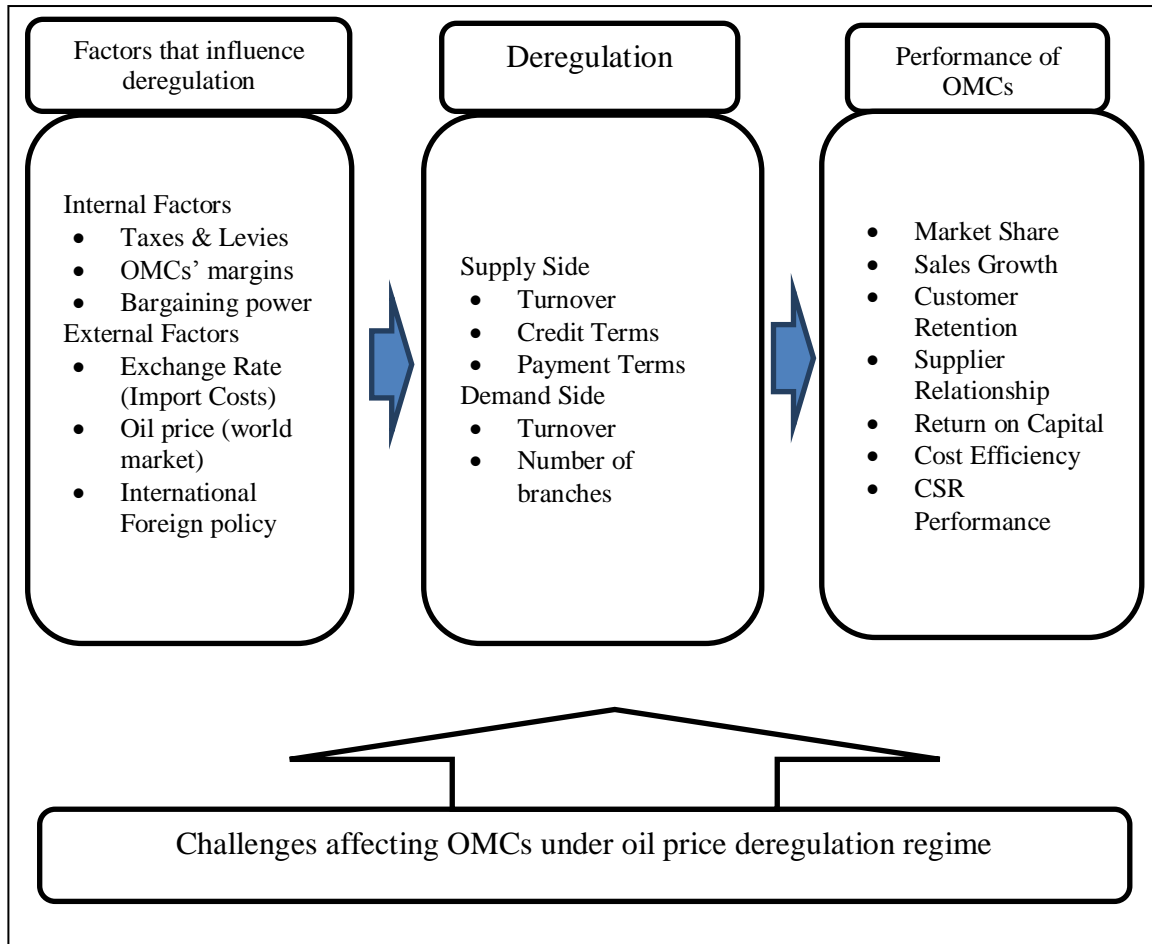


Table 1: Conceptual Framework

Source: Author's Construct (2020)

2.1.2 Theoretical Review

The theoretical review discussed three models including the institutional theory which focus on the aspects of institutional theory, General Equilibrium theory and the economic model will focus on issues of supply and demand, which influence the acquisition and distribution of oil in Ghana.

2.1.2.1 Institutional Theory

The theory of institutions focuses primarily on social systemic aspects that are deeply tied together. The institutional principle examines how basic rules for the determination, definition and assessment of social conduct are developed. Sets of regulations, routines and standards are included in these arrangements (Scott, 2004). Organizations must function according to rules, expectations and values in their society to succeed and grow effectively (Scott, 1995). DiMaggio and Powell (1983) have named this phenomenon institutional isomorphism in which both the systemic and the relevant procedures are important for organisations. Oduor (2010) refers to the institutional theory, as a standard theory, which discusses the various management components of organizations in different environments with different laws, not a new approach. Scott (2004) describes the three key structures of administrative, cultural cognitive and normative institutional systems in his study. The normative framework determines how things should be done and the desired or acceptable principles, while compliance with social duty is focused on social obligations.

2.1.2.2 The General Equilibrium Theory

The general equilibrium theory emphasises the effectiveness of the forces of demand and supply to influence market decisions. Acemoglu (2010) refers to general equilibrium as significant considerations when considering adverse changes. This can lead to price and technology factor shifts that are kept constantly in partial balance. Thus, in a perfectly competitive market what determines the output that an enterprise is willing to supply is a function of so many factors such as its kind of market, the kind of products it

manufactures, its ratio of marginal to marginal income, which entails choosing output which is equivalent to marginal costs and marginal income (Lipsey & Cgrystal, 2004).

Ghana's downstream oil industry is composed of major petroleum marketers and independent marketers that supply homogenous goods but have the capacity to boost prices by creating artificial scarcity (Maduka, Ihonre & Anochiwa, 2015). The aim of the downstream oil sector deregulation is to ensure continuous supply of product and this means that if a single corporation does not have the right to control the sector in which its products are distributed, the sector becomes more competitive.

2.1.3 Empirical Review

The empirical review covers studies that have been conducted in line with the objectives of this study.

2.1.3.1 Factors influencing petroleum pricing in a deregulated oil market

Ackah and Acheampong (2018) reviewed Ghana's recent experience with downstream petroleum products pricing and deregulation and looked at its implications for the nation's energy security needs. The policy has the primary objective bring an end to government subsidies on the product which arises in from exchange rate losses and consumer subsidies. The study welcomes government's decision to revert to the competitive market forces using automatic price formulation as this removes implicit subsidization and its distortionary effects on the economy. With the advent of full deregulation, the burden of managing forex risks will shift from the government to the BDCs and TOR, and any such losses will become their prerogative. Petroleum subsidies, if any, should be redesigned and better targeted at the poor in the form of direct cash transfers as well as entrepreneurial skills training to improve their social and living conditions. Subsidies create distortionary effects and further exacerbate fiscal pressures as government has to borrow or tap into its reserves to offset price differentials.

Yang et al. (2002) studied the price volatility of the crude oil market by examining the market structure of OPEC, the stable and unstable demand structure, and related elasticity of demand. In particular, the impacts of prosperity and recession of the world economy and the resulting demand shift on crude oil price are investigated. The error correction model is used to estimate the demand relations and related elasticity. The income effect on demand functions is evaluated to shed light on future prices. The magnitude and scope of a price hike would be diminished if non-OPEC or domestic production were greatly expanded. Two of the major factors that influence prices of fuel at the pumps in Ghana include world market price of crude and the exchange rate of the Ghana cedi to the USD. In the past, Government through the industry regulator (National petroleum Authority-NPA) regulate the pricing of petroleum products to ensure consumers are protected from the market forces by absorbing some increments as subsidy (Awudi, 2015).

The behaviour of OMCs can be looked at from the supply side and from the demand side. OMCs with advantages in either or both supply and demand side factors are more likely to be market leaders in the determination of prices of petroleum products for "weaker" OMCs to follow e.g. GOIL. From the supply side, OMCs relationships with BDCs is the key factor. Relationships with BDCs also influence credit terms and payment terms, and OMCs with advantages in these factors have a competitive edge. In terms of demand side, OMCs operations and sales or turnover can influence final prices. OMCs with advantage in these factors can compete better. The number of branches and how scattered they are can also influence the turnover of OMCs, and increase OMCs competitive power and therefore pricing of petroleum products (Skaten, 2017).

2.1.3.2 Effect of deregulation on the performance of oil marketing companies

The deregulation of the downstream oil sector and optimal oil pricing in Nigeria were also reviewed by Ezie and Beida (2014). A linear error corrective model was adopted to investigate how Nigeria's petroleum pricing (PR) influenced custom and excise duties (CED), tax on oil income (PPT), and production of crude oil (COP). The unit root test for each of the variables was performed to determine its stationary degree. Nonetheless, despite first and second discrepancies three of these variables were found to be stationary, and then the Johansen Cointegration Test was carried out safely. For regression analysis, the integrated variables were then used. The results of the co-integration show that the variables used in the model are related to a long term or equilibrium. The results showed that, if the petroleum market were deregulated, the volume of import levies would raise the domestic petroleum selling price. This indicates that deregulation would prevent the import of refined fuel and promote direct foreign investment in oil and gas. In addition, the results showed that Nigeria's output of crude oil is well below its full potential and has positively helped raise oil prices in Nigeria over the years.

Bello and Cavero (2008) carried out a study on the Spanish retail oil market, the downstream petroleum sector of Spain, with a focus on the liberalisation and competition pattern since the 1992 market deregulation. The national oleic company CAMPSA Compania Arrendataria Del Monopolio de Petroleos S.A. holds concessionaries and conducts discovery, development, refining and final distribution for the oil products of Spain from 1927 to 1984, according to them. According to them, the petrol industry of Spain undergoes

strict government regulation. The period was marked by poor service quality, administrative, technological, scale and inefficiencies in allocation, which resulted in the liberalization decision. It was noticed, however, that the number of service stations in the country increased from 4800 in 1992 to 8600 in 2005 when liberalization policies brought competition in the downstream market, which resulted in structural changes to the region. The key finding of the study was that the Spanish petroleum industry shifted in a few years from the state's monopoly status to the free market competition that resulted in retail production, development and modernisation. It also offers a strong forum for the national oil company to compete with the newcomers. Another important finding was that different products quality prices were charged, and deregulation of refiners and retail outlets made the final market competitive.

Carranza et al., (2009) carried out a comprehensive analysis on the effect of price control policy on the financial performance of petroleum marketing companies in Canada. Its main aim was to show that price caps create crucial unintended consequences for market prices as well as the productivity of companies through changes in the structure of the market in the long run. They found from their regression analyses that pricing regulations affect the profitability rates of the companies operating in the market due to changes in market structure. The major limitation of this study was its inability to put into consideration the possible equilibrium effects of the price regulation.

Baghebo and Niyekpemi (2015) examine the success and effect of Nigeria's downstream petroleum sector on economic development over the years. Due to previous years data that are not sufficiently available, the time horizon covered 1980-2012. The thesis used a basic model of regression with the ordinary least-square (OLS) data analysis techniques. The findings show a positive and statistical significance of OR, NOR, FDI and CONSUMPT in relation to RGDP. F-statistic also indicates that there are statistically important shifts in independent variables and that deregulation of the downstream market can not be avoided. The government should then deregulate.

Khuen (2015) conducted a study in Kuwait's oil and gas industry on the impact of the price regulation on the profitability of companies. He found that the introduction of price regulation was a beneficial effect on the profitability of companies extracting oil and gas, based on the findings of his study. This is because the cost of production is reduced and public subsidies are available so that the industry is not allowed to float. A study was undertaken by Wanjogu (2015) on petroleum marketers in Kenya. Her research aimed to determine the relationship between the profitability of the oil marketing companies and the introduction in the industry of price caps. She analyzed secondary data and concluded that price regulation has an adverse effect on oil marketing companies' profitability in Kenya. The study then suggested that petroleum marketing firms aim to increase its income performance.

III. METHODOLOGY

3.1 Research Design

A quantitative research approach was adopted. Basically, the study used the survey research which comprises the analytical and descriptive types. Descriptive quantitative research was found suitable for the objective one. The inferential analysis was applied in the study of objective two. To Panter and Sterba (2011), surveys could either be analytical or descriptive depending on the research.

3.2 Population

In this study, the population comprised of Oil Marketing Companies (OMCs) in Ghana. According to the National Petroleum Authority (February, 2019), there are 107 OMC's registered in Ghana. A follow up with the Association of Oil Marketing Companies however revealed that only 85 are in good standing as at December 2019.

3.3 Sampling Procedure

The criteria applied to define the sample frame was that OMCs must have branches all over the country (all 10 regions that existed before the addition of 6 new regions). This brought the population to 10 OMCs as listed in Table 1. After this criteria was applied it was also noted that the OMCs that made the sample were 4 multinationals and 6 locals. Boateng (2018) observed that a prerequisite to sample selection is to define the target population as narrowly as possible; which is the sample frame.

The non-probability method of purposive sampling was applied to select respondents from the various Oil Marketing Companies (OMC's) in the country. OMCs were selected purposefully on the criteria that they were in existence before the deregulation came into place and are still operating within the deregulation, thus they will be in a better position to explain the effect of deregulation on performance of OMCs. Further, participants from the selected OMCs were also purposefully selected based on the criteria of knowledge of deregulation. Thus, three senior managers in the positions of heads of marketing, operations and finance were targeted. The sample size in terms of participants or respondents was 10 x 3 i.e. 30 respondents. Table 1 shows

the list of OMCs engaged in the study and the number of respondents from each of them. The complete list of OMCs in good standing.

Table1: List of OMCs in the Study

No	Name	No of Respondents
1	ALLIED OIL COMPANY LIMITED	3
2	ENGEN GHANA LIMITED	3
3	FRIMPS OIL COMPANY LIMITED	3
4	GHANA OIL COMPANY LIMITED	3
5	PACIFIC OIL COMPANY LIMITED	3
6	PETROLEUM SOLUTIONS LIMITED (PETROSOL)	3
7	PUMA ENERGY LIMITED	3
8	STAR OIL COMPANY LIMITED	3
9	TOTAL PETROLEUM COMPANY LIMITED	3
10	VIVO ENERGY (SHELL GHANA)	3
		30

Source: adapted from NPA table source.

3.4 Data Collection Instruments

Primary data was obtained directly through by the use of questionnaire from heads of three key departments such as marketing, operations and finance, because they were in a position to explain how petroleum price deregulations has impacted on the operations of OMC's. This enabled the researcher to obtain information that was specifically relevant to the subject under study. The secondary data was obtained from published documents, journals articles, Internet sources, newspapers that have a bearing on the study.

3.5 Data Analysis

Reliability Tests were conducted using the Cronbach's Alpha for the factors constituting deregulation, OMCs' performance, and then challenges of OMCs. According to Manerikar and Manerikar (2015), $\alpha < 0.5$ is unacceptable; $0.5 = \alpha < 0.6$ is poor; $0.6 = \alpha < 0.7$ is acceptable; $0.7 = \alpha < 0.9$ is good; and $\alpha = 0.9$ is excellent. The Statistical Package for Social Sciences (SPSS) version 22 was used for data processing and analysis. This software was used to analyse, transform, and produce data in respect of each specific objective demands. Objective one examined the factors influencing petroleum pricing in a deregulated market. The Mean Score (MS) was used to analyse the data to ascertain respondents' opinion on the extent to which each of the influencing factors affected petroleum pricing.

The formula for Mean Score is given below.

$$MS = \frac{\sum W}{N} \quad (1 \leq MS \leq 5) \text{ where}$$

W – is the weight given to each factor by the respondents and is measured the product of the likert scale level and the number of respondents who selected it. The likert scale level ranges from 1 to 5, (where “1” is “strongly disagree” and “5” is “strongly agree”); A – is the highest weight (i.e. 5 in this case) and; N – is the total number of respondents. The mean score is chosen here because it provides the most meaningful interpretation of participants' responses based on a likert scale.

For a meaningful interpretation of the MS, the following intervals adopted from Gravetter and Wallnau (2009:278–302) were applied ($0 \leq MS < 2.5$: Below Average / Poor; $2.5 \leq MS < 3.5$: Average / Good; $3.5 \leq MS \leq 5$: Above Average /Very Good).

With regards to objective two, on the effect of deregulation on the performance of oil marketing companies in Ghana, regression analysis was applied. The model for the regression analysis is as follows:

$$OMCP = b_0 + b_1PPD + \epsilon$$

Where: OMCP is OMC performance; PPD is Petroleum Price Deregulation. Regression analysis produces results, key of which are the coefficients and p-values; the size of the coefficients produced was used to determine the size of the effect of petroleum price deregulation on OMCs performance; while the corresponding probability values which determine the significance of the impact at the given 5%. The analyses was conducted at a 95% level of confidence, hence a critical level of 5% (0.05). Ordinary Least Squares (OLS) Regression analysis is often used to model or analyse data. OLS was opted for because it the most efficient regression

estimator (Huang & Chen, 2018). Majority of survey analysts use it to understand the relationship between the variables, which can be further utilized to predict the precise outcome.

3.5 Data Analysis and Discussion of Results

Profile of Respondents

The section covers the respondents' profile in terms of position, educational qualification, and number of years respondent has worked with the OMC. Table 2 presents a summary of the profile for discussion.

Table 1: Profile of Respondents

Variables	Frequency	Percent
<i>i.</i> Position in OMC		
CEO	11	37%
Fuels Marketing Manager	7	23%
Finance Manager	12	40%
<i>Total</i>	<i>30</i>	<i>100%</i>
<i>ii.</i> Educational Qualification		
Degree	7	23%
Masters	19	63%
Other Professionals	4	13%
<i>Total</i>	<i>30</i>	<i>100%</i>
<i>iii.</i> Number of years working with the OMC		
Less than 1	4	13%
1-5	5	17%
5-10	7	23%
10 years and more	14	47%
<i>Total</i>	<i>30</i>	<i>100%</i>

Source: Field Data Analysis (2020)

Section (i) of Table 2 shows the respondents' distribution by position in OMC. Three main categories were considered- CEOs, Fuel Marketing Managers, and Finance Managers. 37% (11) were CEOs; 23% (7) were Marketing Managers; and 40% (12) were Finance managers. Section (ii) covered educational qualification. 23% (7) were Degree Holders, 63% (19) were Masters degree holders; and 13% (31) had other professional certificates like CA, ACCA, CIMA, CIM, etc. Section (iii) covered the number of years respondent has worked with the OMC. 13% (4) had been with the OMC for less than a year; 17% (5) for 1 to 5 years; 23% (7) for 5 to 10 years; and 47% (14) for 10 or more years. This means that majority of the respondents held responsible roles in the OMC, has at least a masters degree, and had been with the current OMC for more than 10 years. The respondents' profile provides confidence that the responses provided were based on knowledge and experience of the phenomenon under study; and therefore reliable.

3.5.1 Reliability Tests

The Cronbach's alpha was used to determine the reliability of the constructs for the factors constituting deregulation, OMCs' performance, and then challenges of OMCs. According to Manerika and Manerika (2015), $\alpha < 0.5$ is unacceptable; $0.5 = \alpha < 0.6$ is poor; $0.6 = \alpha < 0.7$ is acceptable; $0.7 = \alpha < 0.9$ is good; and $\alpha = 0.9$ is excellent. As shown in Table 2, there were 7 factors constituting deregulation, and the Cronbach's alpha was 0.615; which is acceptable

Table 1: Reliability of Influencing Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.615	7

Table3: Reliability of Deregulation Factors

Reliability Statistics

Cronbach's Alpha	N of Items
.648	5

The Cronbach's alpha for deregulation factors was 0.648, which is acceptable.

Table 4: Reliability of Performance of OMCs

Reliability Statistics

Cronbach's Alpha	N of Items
.654	7

The Cronbach's alpha for OMCs performance was 0.654, which is acceptable.

Table 5: Reliability of Challenges

Reliability Statistics

Cronbach's Alpha	N of Items
.615	7

The Cronbach's alpha for OMCs performance was 0.615, which is acceptable.

The reliability test results show that the constructs used for the main factors were valid.

3.6 Assessment of Factors that influence petroleum price under deregulation

Respondents provided responses on a likert scale of 5 points from strongly disagree (the lowest=1) to strongly agree (the highest=5). The frequencies of the responses are presented first and discussed before the mean score.

3.6.1 Internal Factors

Table 6 shows the responses provided in assessment of Official taxes, levies and port duties as a factor influencing petroleum price deregulation.

Table 6: Official taxes, levies and port charges approved by the Parliament of Ghana

Response	Frequency	Percent
Disagree	4	13%
Agree	17	57%
Strongly Agree	9	30%
Total	30	100%

Source: Field Data Analysis (2019)

$$Mean\ Score = \frac{(1 \times 0) + (2 \times 4) + (3 \times 0) + (4 \times 17) + (5 \times 9)}{30} = 4.03$$

Of the 30 respondents, 13% (4) respondents disagreed, 57% (17) agreed; and 30% (9) strongly agreed. This results in a mean score of 4.03. This represents an inclination towards general agreement with Official taxes, levies and port charges influencing prices of petroleum products.

Table 7 shows the responses provided in assessment of OMCs' margins as a factor influencing petroleum price deregulation.

Table 7: Margins from the Oil marketing Companies (OMCs) to arrive at the ultimate Ex-pump price

Response	Frequency	Percent
Agree	16	53%
Strongly Agree	14	47%
Total	30	100%

Source: Field Data Analysis (2019)

$$\text{Mean Score} = \frac{(1 \times 0) + (2 \times 0) + (3 \times 0) + (4 \times 16) + (5 \times 14)}{30} = 4.47$$

Out of the total respondents, 53% (16) agreed and 47% (14) strongly agreed. This results in a mean score of 4.47. This means that respondents generally agreed that OMCs margins influenced pricing.

Table 8 shows the responses provided in assessment of bargaining power as a factor influencing petroleum price deregulation.

Table 8: Bargaining power of OMCs

Response	Frequency	Percent
Agree	7	23%
Strongly Agree	23	77%
Total	30	100%

Source: Field Data Analysis (2019)

$$\text{Mean Score} = \frac{(1 \times 0) + (2 \times 0) + (3 \times 0) + (4 \times 7) + (5 \times 23)}{30} = 4.76$$

Of the 30 respondents, 23% (7) agreed, and 77% (23) strongly agreed. This results in a mean score of 4.76. With the mean score above 4.5, it suggests a strong agreement to the fact that bargaining power of OMCs influences prices under a deregulated regime.

3.6.1 External Factors

Table 9 shows the responses provided in assessment of exchange rate fluctuation as a factor influencing petroleum price deregulation.

Table 9: Exchange rate fluctuation

Response	Frequency	Percent
Agree	12	40%
Strongly Agree	18	60%
Total	30	100%

Source: Field Data Analysis (2019)

$$\text{Mean Score} = \frac{(1 \times 0) + (2 \times 0) + (3 \times 0) + (4 \times 12) + (5 \times 18)}{30} = 4.60$$

Of the 30 respondents, 40% (12) agreed, and 60% (18) strongly agreed. This results in a mean score of 4.60.

Table 10 shows the responses provided in assessment of importation cost as a factor influencing petroleum price deregulation. This suggests a general agreement to the fact that exchange rate fluctuations influence Pricing.

Table 10: Importation Cost

Response	Frequency	Percent
Agree	17	57%
Strongly Agree	13	43%
Total	30	100%

Source: Field Data Analysis (2020)

$$\text{Mean Score} = \frac{(1 \times 0) + (2 \times 0) + (3 \times 0) + (4 \times 17) + (5 \times 13)}{30} = 4.43$$

Of the 30 respondents, 57% (17) agreed, and 43% (13) strongly agreed. This results in a mean score of 4.43. This represents an inclination towards general agreement with importation costs influencing pricing under a deregulated regime.

Table 11 shows the responses provided in assessment of world market price of crude oil as a factor influencing petroleum price deregulation.

Table 12: World Market Price of crude oil

Response	Frequency	Percent
Agree	9	30%
Strongly Agree	21	70%
Total	30	100%

Source: Field Data Analysis (2019)

$$\text{Mean Score} = \frac{(1 \times 0) + (2 \times 0) + (3 \times 0) + (4 \times 9) + (5 \times 21)}{30} = 4.70$$

Of the 30 respondents, 30% (9) agreed and 70% (21) strongly agreed. This results in a mean score of 4.70. There is a strong agreement from respondents that world market prices influence pricing of oil products under deregulation.

Table 13 shows the responses provided in assessment of International foreign policy of oil exporting countries as a factor influencing petroleum price deregulation.

Table 13: International foreign policy of oil exporting countries

Response	Frequency	Percent
Disagree	7	23%
Agree	15	50%
Strongly Agree	8	27%
Total	30	100%

Source: Field Data Analysis (2020)

$$\text{Mean Score} = \frac{(1 \times 0) + (2 \times 7) + (3 \times 0) + (4 \times 15) + (5 \times 8)}{30} = 3.80$$

Of the 30 respondents, 23% (7) disagreed; 50% (15) agreed, and 27% (8) strongly agreed. This results in a mean score of 3.80. With the mean score below 4, it suggests a weak agreement to the fact that OPEC policies influence pricing under deregulation. This however suggests respondents' poor understanding among of the factors that determine world market price of oil.

From the analysis above, the ranked mean score table was compiled and presented in Table 14.

Table 14: Mean Scores for assessment of factors that influence price under deregulation

Assessment Criteria	SD	DA	NS	AG	SA	Total	MS	SD
Internal Factors	1	2	3	4	5		4.4222	
Bargaining power of OMCs	0	0	0	7	23	30	4.7667	0.41
Margins from the Oil marketing Companies (OMCs) to arrive at the ultimate Ex-pump price	0	0	0	16	14	30	4.4667	0.50
Official taxes and levies approved by the Parliament of Ghana	0	4	0	17	9	30	4.0333	0.94
External Factors	1	2	3	4	5		4.3833	

World Market Price of crude oil	0	0	0	9	21	30	4.7000	0.45
Exchange rate fluctuation	0	0	0	12	18	30	4.6000	0.49
Importation cost	0	0	0	17	13	30	4.4333	0.50
International foreign policy of oil exporting countries	0	7	0	15	8	30	3.8000	1.08

Source: Field Data Analysis (2019)

The mean scores show that internal factors recorded a mean score of 4.42; which is very high. Among the internal factors bargaining power was the most influential with a mean score of 4.77; followed by OMCs' margins (4.47); and then official taxes and levies (4.03). External factors on the other hand recorded a mean score of 4.38, which is also very high. World market price of crude oil ranked highest among the external factors with a mean score of 4.60; followed by exchange rate fluctuation (4.60); importation cost (4.43); and international foreign policy of oil exporting countries (3.80). This findings agree with that of Yang et al. (2002). Further analysis of the data however shows that when international foreign policy of oil exporting countries is taken out since it recorded a mean of 3.8 and standard deviation of 1.08 (relatively higher than all the other standard deviations, external factors record a mean score of 4.56 which is higher than that of the internal factors. Awudi (2015) did not categorise the factors that influence price deregulation of petroleum products, but also asserted that the factors that influence petroleum price deregulation included taxes and levies, world market price of crude oil, cost of importation, and OPEC policies.

3.7 Effect of Price Deregulation of Performance of OMCs

Multiple regression techniques were applied to find the effect of petroleum price deregulation on performance of OMCs. The performance measure factors were transformed into one variable – Performance of OMCs. The Coefficient, model summary and ANOVA, results are presented below.

Table 15: Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	4.625	.257		17.977	.000
Turnover of OMC influences the supply price from BDC	.061	.030	.164	2.000	.047
Credit Terms (Period of payment) influences the supply price from BDC	.125	.044	.351	2.857	.005
Payment Terms (Cash/Credit) influences the supply price from BDC	.146	.041	.430	3.573	.000
Turnover of OMC influences the prices at which they sell to final consumers	.039	.036	.104	1.083	.280
Number of branches and operational costs associated with price changes influences the price at which OMCs sell to final consumers	.009	.044	.017	.201	.841

a. Dependent Variable: Performance of OMC

The coefficient results show that OMCs turnover from the supply side recorded a coefficient of 0.061 with a p-value of 0.047. This means that OMCs turnover has a significant positive effect on the performance of OMCs altogether. The credit terms of OMCs recorded a coefficient of 0.125 and a p-value of 0.005. This means that OMCs credit terms with BDCs has a significant positive influence of their performance. The payment terms of OMCs recorded a coefficient of 0.146 and a p-value of 0.000. This means that OMCs payment terms with BDCs has a significant positive influence of their performance.

The OMCs turnover (demand side) recorded a coefficient of 0.039 and a p-value of 0.280. This means that OMCs turnover (demand side) has an insignificant positive influence of their performance. The OMCs

number of branches recorded a coefficient of 0.009 and a p-value of 0.841. This means that OMCs number of branches has an insignificant positive influence on their performance. The finding also agrees with Awudi (2015) who also indicated generally that petroleum price deregulation significantly affects the performances of OMCs positively for those with capacity because they can compete; and negatively for those without enough capacity to compete. The main finding of Awudi (2015) was that deregulation impacts negatively on the OMCs, which is contrary to the main findings of this study. The reason for this disparity is that the sample for this study was largely OMCs with capacity in terms of finance and market share.

Table 16: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.257 ^a	.066	.043	.22905

a. Predictors: (Constant), Number of branches and operational costs associated with price changes influences the price at which OMCs sell to final consumers, Credit Terms (Period of payment) influences the supply price from BDC, Turnover of OMC influences the supply price from BDC, Turnover of OMC influences the prices at which they sell to final consumers, Payment Terms (Cash/ Credit) influences the supply price from BDC

The R-squared shows that 6% of variations in the performance of OMCs can be explained by petroleum price deregulation. This means that 94% of variations in OMCs performance is accounted for by other factors not covered in this study. These factors could include size of OMC, Managerial competence, initial capital outlay, location of stations, taxes and other operational costs.

Table 17: ANOVA

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.757	1	.151	2.886	.015 ^b
	Residual	10.703	28	.052		
	Total	11.460	29			

a. Dependent Variable: Performance of OMC

b. Predictors: (Constant), Number of branches and operational costs associated with price changes influences the price at which OMCs sell to final consumers, Credit Terms (Period of payment) influences the supply price from BDC, Turnover of OMC influences the supply price from BDC, Turnover of OMC influences the prices at which they sell to final consumers, Payment Terms (Cash/ Credit) influences the supply price from BDC

The ANOVA results also show that the p-value for the model is 0.15 which is less than 5%; hence significant. This means that the 6% of variation in OMCs performance being explained by the independent variables (deregulation parameters) is a significant portion. This is in line with the findings of Khuen (2015), who found that there was a positive effect of the introduction of price regulation on the profitability of the oil and gas extracting companies. This effect was attributed to the reduction in the cost of production and presence of government subsidies to keep the industry afloat.

3.8 SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

The study sought to assess the effect of petroleum price deregulation on the performance of selected OMCs in Ghana. Specifically, the study sought to determine the factors that influence price under petroleum price deregulation; and the effect of petroleum price deregulation on performance of OMCs.

3.8.1 Summary of Findings

Factors influencing price deregulation of petroleum products

The study found that internal factors influenced prices more than external factors under deregulation.

It is established that under the internal factors, bargaining power is the most influential, followed by OMCs' margins; official taxes and levies; and then port duties. Under external factors world market price ranked highest followed by exchange rate fluctuation, importation cost; and international foreign policy of oil exporting countries.

External factors also become more influential when the influence of OPEC foreign policies is taken out of the equation due to the high standard deviation in responses.

Effect of deregulation of performance of OMCs

The study revealed that petroleum price deregulation has a significant positive effect on the performance of OMCs in Ghana.

It is established that petroleum price deregulation accounts for a significant portion of variations in the performance of OMCs.

3.8.2 Conclusions

This study sought to determine which conditions that influence price the most under deregulation; the effect of price deregulation on OMCs performance; and the challenges they face under the deregulated regime.

Deregulation of petroleum prices brings about a number of conditions in the supply chain activities of OMCs which allow the OMCs to be able to determine the final prices at which they sell petroleum products to final consumers. Depending on the price margins OMCs are able to control and the demand effective demand they attract, their performance is affected financially, which in turn affects other performance measures. The study concludes that internally, OMCs bargaining power and the margins they able to control are the most influential factors; while externally it is the exchange rate fluctuation. The exchange rate fluctuation is very influential because when the exchange rate fluctuates unfavourably, OMC still have some control depending on how much foreign exchange they already have; or their source of foreign exchange. This would give various OMCs different levels of control over the price at which they can sell their products. The strongest determinants prices of petroleum products tend to be in favour of OMCs with clout. Weaker OMCs who are in the majority may suffer if they do not put in measures to strengthen their competitiveness.

With the power to determine prices of petroleum products, the deregulation regime has a significant effect on the performance of OMCs. The study also concludes that macroeconomic conditions and black market activities were the most pressing challenges under the deregulated regime. The way forward is that government puts in effective macroeconomic policies to stabilise macroeconomic conditions like the exchange rate in particular and also OMCs in collaboration government and relevant state authorities to identify or fish out illegal oil operators.

3.8.3 Recommendations

The recommendations are put forward in line with the objectives of the study.

Determinants of Prices

The determination of prices lies with OMCs who have the bargaining power and are well-cushioned against macroeconomic instability, and these OMCs are in the minority.

It is important for government, in collaboration with the AOMC to put in measures that would give all OMCs a fair level of competitiveness. This can be done by providing support in terms of finance and training for weaker OMCs to also develop faster. The interest of government is not in strengthening the weaker in the industry but rather to create fairness and standardization to boost the economy. OMC's must therefore consider all available price inputs and consider necessary cuts to maintain their level of competitiveness in the industry.

A fair level of competitiveness for all OMCs would strengthen the performance of the downstream sector as a whole.

Effect of Deregulation of Performance of OMCs

With the new regime having a significant impact in the performance of OMCs, it important that government puts in place improved policies for the impact to be largely positive than negative. Even though deregulation has given an upper control to OMCs in price determination, government still has the controlling power in the final determinants to consumers. The key most important policy decision should be on the fixed tax margin which needs to be reduced. Secondly, lending rates for bulk storage suppliers be made flexible to the OMCs which in turn can bring a sigh relief in clearing debts. The cash mode of sales is suffocating market trends which can affect the supply chain.

Limitations of the Study

The main limitation for this study was covering a large sample size that would include a larger number of OMCs. With the sample frame used, the OMCs in this study were ones with capacity in terms of finance and market share and in a position to be referred to as price makers who would naturally benefit from deregulation. The larger part of OMCs excluded from this study can generally be referred to as price takers and are not likely to benefit from the deregulation of petroleum prices.

Future studies can consider increasing the sample size to include more OMCs.

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