

UNIVERSITY OF CAPE COAST

FACTORS AFFECTING THE PROFITABILITY OF RETAIL FUEL
OUTLETS IN URBAN AREAS: A CASE STUDY OF ACCRA

BY

THEOPHILUS YARBOI TAWIA

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DECLARATION

Candidate's Declaration

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

Candidate's Signature Date

Name: Theophilus Yarboi Tawia

Supervisor's Declaration

I hereby declare that the preparation and presentation of the dissertation were supervised in accordance with the guidelines on supervision of dissertation laid down by the University of Cape Coast.

Supervisor's Signature Date

Name: Innocent Senyo Kwasi Acquah

ABSTRACT

Many fuel stations in Ghana have explored alternative sources of income in order to remain profitable and it is a concern that there are too many fuel stations, resulting in an overtraded market. The retail fuel outlet businesses in the country incorporated the usage of various market mix elements to improve their profitability, price positioning, and competitive advantage to survive and grow (Johne & Davies, 2002). Achieving efficient and effective product marketing strategy by an organization is difficult. This is as a result of the ambiguity and instability of economic factors. Although some research efforts have been undertaken to explain issues pertaining to the impact of business structure and strategies on the performance of fuel prospecting industries in developing economies (Chukwu, 2002). Many of these research efforts do not provide answers to the variables that influences profitability in retail fuel outlets within urban settings. The study is a single case study of Shell Oil Company in Accra. The purpose of the study is to investigate whether shell site and location variables influence profitability or the average sales volume of fuel. The quantitative research approach adopted enabled the researcher to compute profitability ratios from secondary data sources for the study. The findings show that average sales volume of fuel has a positive relationship with shell site and location. This means that when traffic flow and buying area of a fuel station are high, sales volume increase; and when accessibility and visibility to the fuel station have a high score, average sales volume of fuel is also high.

KEY WORDS

Factors

Profitability

Retail Fuel

Outlets

Urban

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DEDICATION

To my dearest lovely wife,
Mrs. Juliana Naa Okaikor Tawia

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LIST OF ACRONYMS

APPPF	Automatic Petroleum Product Pricing Formula
APT	Arbitrage Pricing Theory
ATMs	Automated Teller Machines
BDC	Bulk Oil Distribution Companies
CAPM	Capital Asset Pricing Model
CS	Cost of Sales
EBIT	Earnings before Interest Rate and Taxes
GDP	Gross Domestic Product
GMM	Generalized Method of Moments
GPM	Gross Profit Margin
GS	Gross Sales
LPG	Liquefied Petroleum Gas
MPT	Modern Portfolio Theory
NPA	National Petroleum Authority
NPM	Net Profit Margin
OLS	Ordinary Least Squares
OMC	Oil Marketing Companies
OPM	Operating Profit Margin
STATA	Data Analysis and Statistical Software
TC	Total Cost
TR	Total Revenue
UK	United Kingdom
USA	United States of America
WLS	Weighted Least Squares

WTO World Trade Organization

CHAPTER ONE

INTRODUCTION

Background to the study

Recently, new economic opportunities have been created in emerging oil and gas industry, worldwide. Though in its infant stage in Ghana, many downstream distribution channels have been and continue to develop. The development of the energy sector has improved living standards of citizens by increasing output of most countries.

An important component of energy is oil and gas. Weirauch (2000) confirms the important contribution of oil and gas in economic development. In developed countries where the petroleum market is fully deregulated, the reliance of fuel stations on additional sources of income is commonplace. In the USA, fuel is considered the volume driver, whilst convenience store sales drive the bulk of the profits (Reid, 2004).

A survey performed by National Petroleum News in 2005, indicated that 66.5% of sales relate to motor fuel, but these sales only contributed 31.7% to the gross profit in the industry. The United Kingdom is no different, and Shell has admitted that they make no profit from UK fuel sales (Harwood, 2006). Profits from European fuel sales are also being eroded, causing companies to search for new revenue streams (Weirauch, 2000).

Literature provides extensive studies on the emerging decline in profitability of retail fuel outlets but most of these originate from developed economies and had therefore not considered the specific environment in different regions in emerging markets. In recent years, a number of studies have aimed at examining the variables that determine the profitability of retail

fuel outlets. A study conducted by Sartorius et al (2007) in South Africa, found out that urban petrol stations selling more than 370,000 liters of fuel per month are the ones likely to be profitable. And that greater number of fuel stations, will have to rely on non-forecourt activities to survive. The study also reveals that location significantly influences urban retail sales volumes whilst fuel station size and the fuel price play a lesser role (Sartorius et al., 2007).

Oil and gas contribute a larger share of GDP in most developing countries in sub-Saharan Africa, such as Nigeria. And also adds significantly to national economic development (Chukwu, 2002). According to Chukwu (2002), exports of oil and gas in Nigeria and profits recorded about 98% of GDP and 83% of federal government revenues. One of the main offshoots of the industry is the emergence of fuel (petrol and/or diesel) stations across the country. Since the partial deregulation of the petroleum downstream in the early 2000s, the fuel retail market has seen extensive expansion by local participants, resulting in intense competition with its attendant impact on the profitability of outlets.

Over the past decades, there has been an unpredictable profits in retail fuel businesses, as a result of changes in fuel prices and other changes in market variables. Instability in the variables influencing fuel sales volume, which leads to volatility in profits, makes investment planning risky. Samli and Kaynak (1994) lament that the key problem with the determinants of firm's profitability in developing economies is that it minimizes the impact of marketing environment on the achievement of performance measures. Sound and robust marketing commitment on the part of retail fuel sales-people are important to the survival and growth of the industry, considering the subtle,

unstable and seemingly hostile business environments in which contemporary business organizations operate (Osuagwu, 1999).

Fuel retail outlets in Ghana are confronted with a wide range of variables that constrain profit and a significant number of outlets are declining in profit. In the event of further deregulation, it is conceivable that many retail fuel outlets will go out of business. In the past, the petroleum downstream market activities of supplying fuel through retail fuel outlets, have been mainly dominated by the oil marketing majors such as Shell, Total and Goil. Over the years, and in particular, since the start of the deregulation of the downstream oil sub-sector, the petroleum sector has attracted indigenous entrepreneurs and other individual entrants, with increasing interest in storage, distribution and sales. There appears to be good prospects for investors; fuel distribution has become an attraction for many people. New stations are also being established in the city centers. Though this development is exciting, because of the associated increase in economic activities through job creation and increase in business activities in wider areas of the country, some industry players have cautioned the rush into this area of investment.

In their view, the springing up of these petroleum stations has been too phenomenal and doesn't augur well for the industry given that margins are so little. In an industry where profitability at outlet level is significantly determined by its throughput volume, one questions whether the growth in the size of the petroleum retail outlets is sustainable. The proliferation of petroleum retail outlets and fuel service stations across the country however comes with pressure on the profitability at the outlet level.

Statement of the problem

Many fuel stations have explored alternative sources of income in order to remain profitable and it is a concern that there are too many fuel stations, resulting in an overtraded market. The retail fuel outlet businesses in Ghana incorporated the usage of various market mix elements to improve their profitability, price positioning, and competitive advantage to survive and grow (Johne & Davies, 2002).

However, achieving efficient and effective product marketing strategy by an organization is difficult, as a result of the ambiguity and instability of economic factors. Moreover, although some research efforts have been undertaken to explain issues pertaining to the impact of business structure and strategies on the performance of fuel prospecting industries in developing economies (Chukwu, 2002). Many of these research efforts do not provide answers to the variables that influences profitability in retail fuel outlets within urban settings.

Previous studies modelled locations and pricing decisions in the gasoil market (Chan, Padmanabhan & Seetharaman, 2005); crude oil development (Chukwu, 2002); demand for automobile fuel (Graham & Glaister, 2002) and an examination of the variables influencing the fuel retail industry (Sartorius et al., 2007). However, these studies did not consider the factors affecting profitability of retail fuel outlets. Moreover, most of these studies did not focus on urban areas and studies that have been done in this area were conducted in different economies. This study therefore seeks to examine the factors affecting the retail fuel market in urban areas of Ghana.

The fuel retail sector operates in a highly competitive environment that is characterized by low profit margins and high cost of sales. It is both capital and labour intensive; site and location of fuel station determine its profits. It can be seen that even though the industry overall is growing, the share of the three main players (TOTAL, Vivo Energy and GOIL) has been declining steadily. Ghana fuel retail outlets are confronted by a wide range of variables that constrain profit and a significant number of outlets are not profitable. In the event of further constrained external factors, it is conceivable that many fuel stations will go out of business. For that matter, it is imperative that retailers understand the variables affecting the profitability of outlets in order to remain in the industry.

Objectives of the study

The main objective is to find the factors affecting the profitability of fuel retail outlets in the urban areas (Accra).

The specific objectives of this study are to:

1. identify the factors that affect the sales volume of retail fuel at Shell Oil Company in Accra.
2. examine the trend of estimated profits of fuel retail outlets over the period (2010-2014) at Shell Oil Company in Accra.
3. determine how site and location of fuel retail station influence profitability and sales volume of a fuel retail outlet of Shell Oil Company in Accra.
4. To suggest ways of improving sales of fuel in line with site and location of retail outlets.

Research questions and hypothesis

The research questions and hypothesis for the study are as follows:

1. What are the factors that affect the sales volume of retail fuel at Shell Oil Company in Accra?
2. What is the trend of estimated profits and average sales volume of fuel retail outlets over the period (2010-2014) at Shell Oil Company in Accra?
3. Site and location of fuel retail station have no influence on profitability and sales volume of a fuel retail outlet of Shell Oil Company in Accra.
4. What are ways of improving sales of fuel in line with site and location of retail outlets?

Significance of the study

This study determines the variables that influences profitability of the retail fuel outlets in Accra. The findings of the study would assist the Ghana Government and stakeholders to understand the extent to which these variables has affected firm profitability and how this might impact on economic development. The study would contribute to the body of knowledge for the use by other researchers and interested parties. The outcome of this study will indicate the extent to which location and size influence fuel retail volumes and for that matter the profitability of the outlet.

This information will serve to inform investors on how best to select sites for the purpose of putting up fuel retail outlets. It will also serve to inform reliably in the computations of expected cash flows for investments in this area using a predictive model based on the characteristics of the outlet location and size. It is also expected that the recommendations that will be

made from this study will be very useful to the oil and gas downstream-petroleum retail market in reshaping policies to ensure the sustainability of fuel retail outlets. And for academia, it will serve as a reference material for any person interested in understanding or gaining knowledge on the key variables that influence the profitability of the fuel retail market.

Organization of the study

This study is organized into five chapters. Chapter one presents the introduction of the study. Chapter two reviews existing relevant literature related to the study. Chapter three outlines the methodology employed to accomplish the objectives of this study. The results and discussion of the study were presented in chapter four. Finally, the summary, conclusions and policy recommendations were presented in chapter five.

CHAPTER TWO

REVIEW OF RELATED LITERATURE

Introduction

Literature that have been reviewed for the purpose of the study provides an overview of the downstream Oil and Gas Industry in Ghana, industry players and their respective roles. This chapter reviews theories and concepts on factors influencing the downstream oil and Gas Industry. It provides an overview of Oil and Gas Industry in developing countries.

It explains why location and size of fuel retail outlet matters and the competitive advantage that an organization could gain on its competitors when it implements good network strategy informed by a reliable investment decision making.

Theoretical review

Risk and performance theories

Theories of risk and performance models have evolved over the years. These theories and models postulated risk performance is the result of the output affected by factors that are classified into specific macroeconomic factors. From the Capital Asset Pricing Model (CAPM), a high systemic risk connotes the performance of investors required higher. Systematic risk is attributed to factors that affect the whole financial market and reflects factors such as government policies, political climate and changes in the economy. specific risk is specific to a company or industry specific and reflects factors such as labor relations, management quality or quantity of competitors.

Systematic risk is said to be uncontrollable and can not be avoided through diversification because managers have little or no control over the systematic risk. However, it is said that unsystematic to be controllable because business managers have maximum control over these factors and preventable risks through diversification. Although the CAPM says securities and portfolio risk and return, it is applicable to the company or business settings. Thus the CAPM provides a balance, a guarantee to provide a return equal to the systematic risk is expected (Miller, 1969). Therefore, investors should be rewarded for the specific risk, such as CAPM assumes that investors are at risk and specific risk aversion complete diversified. Given the simplistic view of the CAPM and its failure to reflect the conditions of real life, which was contested by other theories like the theory (APT) and the Arbitrage Pricing modern portfolio theory (MPT) market. While the Arbitrage Pricing Theory idea or justification of asset pricing model expands.

In the context of the APT, the arbitration of a competitive market price to ensure a balance or equilibrium based on risk and performance. The safety of reward or return expected to be provided to the risk-free rate plus the risk premium on the risk factors that are uncertain. The reason the two are the same, except that the APT involves multiple risk factors. MPT is also an extended version of CAPM and APT, where diversification is the key to determine the risk and return. MPT emphasizes that investors are able to reduce risk and at the same time, increased yield when they invest different assets with less than a correlation (Miller, 1969).

Theory of market power

Studies into firm performance have been in literature since the late 1980s and the early 1990s where the Market Power (MP) theory was applied (Scherer, 1980). The market power theory posits that the market structure of the industry influences the performance of firms. This theory consists of two distinct approaches; the Structure-Conduct-Performance and the Relative Market Power hypothesis. The Structure-Conduct-Performance approach posits that the profitability of a bank may rise with the market power that comes as a result of the concentration of the market. The Relative Market Power hypothesis on the other hand posits that bank profitability can be influenced by market share and that, only large firms can increase price and make more profit.

The traditional theory of market power provides an explanation to performance. According to Shepherd (1970), "Market power is the ability of a market participant or group of participants (individuals, companies, associations or others) to influence the price, quality and nature of the product in the market. In turn, market power can lead to high, risk-free and non-competitive profits, which essentially means that diversified companies bring broad market power to the new markets in which they enter. Competitors (Scherer 1980, Shepherd 1970) is independent of the specific markets in which they enter and in fact is reinforced by the number of markets for which they compete, their market share and the specific skills required to acquire a market share for dominant position in a given market.

Conceptual review

Profitability of retail fuel outlets are affected by location and site. This section provides what these factors mean relative to the study.

Location of retail fuel outlets

The location of the fuel station consisted of the sum of both traffic flow and market center (buying area, 250m away) scores of the fuel station. A fuel retail station can only refuel as many vehicles as the number of pumping bays it has. The ratings that will be allocated to traffic flow and buying area are between 5 and 10; and 1 and 6 respectively. Scatter diagram will be employed to determine the relationship between the location of the fuel and the annual sales volume in liters for the fuel stations.

Site of retail fuel outlets

The Site score is defined by the Accessibility of the Station and also the Visibility of the Station from 250 meters. Visibility and Accessibility will be given ratings (between 1 and 10 points – from the least to the most visibility). Scatter diagram will be employed to determine relationships.

An overview of the oil and gas industry

Energy does not only play the role of economic, political and social development of the country, but also helps to improve the social and economic life of families. Exporters and importers of oil and gas are the main channels for providing income and foreign exchange gains for government and investors.

The main risk factor affecting the oil and gas market globally is the change or a drop in crude oil prices. The increase in oil revenues and government gas, is a reflection of the increase of crude oil production and higher prices. Lyons and Plisga (2005) show that whenever there is a decline in oil prices, oil revenues are also affected, which confirms the theory of price elasticity.

During the year, oil and gas, such as creating sales retail fuel stations, increased due to the production and use of the car. Market adjustment of the oil and gas industry makes an important impact on retail petrol stations, mainly retailers are unable to guarantee profits. When there is a decrease in sales of high manufacturing overhead, and the retail market have a fuel efficiency of risk too. There are many variables, such as customer loyalty, and high fuel prices, operating costs, changes in the economic criteria, such as interest rate and the inflation rate and the rate currency, political constraints and business administration - all affect the fuel economy and the industry as a whole a station. The demand for raw materials, on the other hand, resulted in crude oil price increase on the market. It is largely consumer reaction in this case.

However, these challenges make the oil and gas are difficult to finance private and public sector companies. In the past, oil fuel supply market activities through fuel retail outlets, is dominated mainly by the oil companies. Over the years, namely since the beginning of the liberalization of refining sub-sector and oil trading attract men of original works and other individual contributions to the growing interest for the storage, distribution and sales. It

seems there are good prospects for investors. Fuel distribution has become a magnet for many people factors.

Downstream fuel retail activities in Ghana

The oil industry is generally divided into three main components - upstream, middle of the road and downstream (Lyons & Plisga, 2005). Usually included halfway companies in the downstream segment. The downstream sector is a term commonly used to refer to crude oil, the sale and distribution of natural gas and products derived from the refining of crude oil. These products include liquefied petroleum gas (LPG), gasoline, or petrol, jet fuel, oil and other fuel oils, asphalt and petroleum coke. It includes the downstream oil refineries and petrochemical plants, and distribution of petroleum products, and retail stores and gas distribution companies.

The oil sector in Ghana was not fully organized until early 2000. The import, refining (refined fuel storage), the pricing and allocation of oil companies, oil trade was only done by the Government of Ghana (Ministry of Energy, 2010). In the late 1990s, the government began to examine the potential of the vitality and development of the deregulation of the process industry. In the early 2000s, when there was a change of government, the new government implemented the first phase of the process of lifting the restrictions. During this period, the only fuel retail companies were Shell and Mobil marketing companies, Total, Elf, engine and Onado. Entry was restricted and many people who want to build fuel stations did not receive authorization (Ministry of Energy, 2010). This led to deregulation to reduce the barriers of entry into a local marketing WTO Acharkat- oil (known as

independent name) to start working. In mid-2000, the import and distribution of refined fuel in large quantities leave, too, and began to negotiate local business incubators, as well as the government allowed OMC to announce that, for the old pump prices of their own. In 2006, the estimated number of about 30 WTO, however, is estimated at about 500. At the end of 2011 in collaboration service stations, the OMC has reached 64 with a number of fuel filling stations increasing to 1419. At the end of 2013, there were 84 JI run total 2253 stations.

The main actors are Total, GOIL, Vivo Energy (Shell) (NPA, 2014). It led to the organization of the downstream industry, intense competition, and this led to the rapid expansion of new gas stations by the local Staroil WTO, allies, oil etc. Glory (NPA, 2014). In fact, this new local JI benefited from the lifting of restrictions on the establishment of service stations throughout the country and closer to its customers. This results in the narrowing of the stock market of the three major traditional players - Goil, Vivo Energy and Total.

Domestic taken OMCs- independent market with a share of over 60% market share. For example, Goil was the market leader at the end of 2012, the company with a total of 13.50%, followed by Total SA with 13.02% and Vivo with 11.60% (representing a 38 30% of the market). However, later only in general terms, at the end of 2013, market leader in Goil, but even with the 12.22% (loss of about 1.28%), followed by TOTAL with 11.35% (loss about 1.85%) and energy Vivo with 11.0% (a loss of about 0.63%) (NPA, 2014). This means that the three main players lost their share of the common market for about 4%. Again, in 2012, sold a total of 2.7bln liters of fuel through the retail market, but at the end of 2013, the total market volume reached 3.05bln

liter. Some volume of 255mln liters more than in 2012. However, the three main players contributed only 18,04mln liter comes mainly from Vivo since the lost of both total and Goil files .

In addition, independent local OMCs- is very aggressive in terms of creation of several fuel stations compared to the three main actors were. This is due to the fact that the period between 2011 and 2013, has built an average of 417 service stations and running a mostly Independent year (NPA, 2014). Indeed, while the top three players in the same period a key only makes an average of 22 stations per year and independent stations built about 395 per year. In addition, at the end of the first quarter of 2014 (the end of Q12014), a total of 197 integrated service stations and the total number, the leader in all three markets; Overall, it can only open 29 new Vivo Energy service stations and Goil (NPA, 2014) activities stations can be divided into two categories. First, the activities of the court and the essence of diesel and lubricants include sales. Second is the additional activities that include convenience stores, car washes, ATMs etc.

The pricing of fuel in at the pumps is regulated. The pricing of fuel are regulated and reviewed bu regulatory framework, NPA (the regulator), using Automatic Petroleum Product Pricing Formula (APPPF) on a bi-weekly basis. The performance of fuel retail operations has been shown at a declining rate.

Determinants of profitability

A careful study of the financial statement of an organization reveals the success or failure of that organization. The performance of firms determines the ability of that firm to meet the needs of their stockholder and

stakeholder since these firms are businesses organized to maximize the value of the shareholders' wealth invested in the firm at an acceptable level of risk (Rose & Hudgins, 2008).

The excess of income over expenditure at a specified period of time is referred to as profit. Every organization especially continue to be in existence because of profit. Profitability is the term which measures profit expressed in percentage. It is a relative concept which is quite useful in decision-making and it indicates earning capacity of the retail fuel outlets. Another main issue here is profit planning, which consists of various steps to be taken to improve the profitability of the retail fuel companies. Profitability is the most important and reliable indicator as it gives a broad indication of the ability of an organization to raise its income level (Guru, Staunton & Balashanmugam, 2002). The determinants of profitability can be divided into two main categories namely the internal determinants which are management controllable and the external determinants which are beyond the control of the industry.

Internal determinants of profitability

Internal factors such as the level of liquidity, capital adequacy, expense management, change in capital and asset risk, operational efficiency, and market interest rates are internal determinants of profitability. These factors are mainly influenced by a industry's management decisions and policy objectives. Internal determinants include financial statement variables and profit and loss account. Profit and loss statement management is directly related to income and expense management or returns and cost management

(Sufian & Chong, 2008). Level of liquidity is one internal determinant of profitability.

Liquidity is the degree at which an asset can easily be converted into cash without any loss in value. The retail fuel often hold liquid assets that can be easily converted into cash through the sales of fuel. Liquid assets are usually associated with lower rates of return and therefore higher liquidity would be associated with lower profitability (Bourke, 1989).

The main emphasis would be confined to areas such as managing prices and quantity of liters sensitivity and margin, and allocation of expenses. Efficient management of expenses explain high profitability that is to say that reducing expenses improves the efficiency and hence raise the profitability of a firm as operating expenses ratio is reduced (Bourke, 1989).

A research reported by Molyneux and Thornton (1992) suggested that firms with higher salaries and benefits would require higher market share and high sales to maintain profitability. This supports the assumption of an inverse relationship between staff expenses and profitability of firms.

Market Interest rates and prices also affect firm profitability. A subsequent research conducted by Guru et al., (2002) revealed that high interest ratio was associated with low profitability and inflation was found to have a direct effect on firm performance. Changes in capital and asset risk relate positively to firm profitability (Bourke, 1989). Bourke explained this by assuming that well capitalized firm may enjoy access to cheaper and less risky sources of funds and better quality asset markets.

External determinants of firm profitability

The performance of firms is subject to several factors like the nation's economy, the financial market structure, and the legal and political environment in which they operate. Thus, the external determinants of retail fuel marketing companies' profitability are these factors which are external to the industry and hence outside the control of management which has an impact on profitability.

According to Alfumi and Awad (2003), market concentration is an important factor that affects profitability; this is because market concentration fosters collusion among firms in the market and earns monopoly profits. Market concentration and competition acts as a barrier to market entry as such there is a negative impact on profits in cases where retail fuel outlets or firms are highly concentrated. On the other hand, concentration may in fact be positively related to foreign companies' profitability if the market structure of a less developed country is dominated by foreign firms that have been found to be more proficient than the domestic firms (Kosmidou, Pasiouras & Tsaklanganos, 2007). Competition among the retail fuel outlets including all potential competitors also play a major role in affecting firm profitability since new entrants will increase rivalry in the market.

One significant determinant of profitability is the size of the market, since the bigger the market, the larger the firm's potential for profits. Bigger market share influences profitability and growth in the market, creating more opportunities for firms, thus generating more profits (Smirlock, 1985). Since large firms are believed to benefit from economies of scale, they are able to generate their outputs or services more economically and efficiently than

smaller firms. The outcome is that, larger firms earn higher rates of profit provided entry is restricted. Another important macroeconomic condition possibly affecting both the costs and revenues of the retail fuel companies is the inflation rate and prices.

Empirical review

The downstream activities in Ghana are sub-divided into Retail, Commercial, Bulk Oil Distribution Companies (BDC) and Haulage or Transportation business units. The Retail business focuses on the construction of fuel stations, storage and selling/distribution of petroleum products at the stations. Commercial business includes storage and distribution of petroleum products to mining, construction and agro forestry companies. The downstream sector is dominated by Shell, Total, Goil, Engine and Star Oil. They control about 50% of the market share out of some 80 oil marketing companies (OMCs) in Ghana. The downstream petroleum sector in Ghana was fully regulated until early 2000. The importation, refinery, storage of refined fuel, pricing and distribution to the Oil Marketing Companies of petroleum products was solely done by the Government of Ghana.

In the early 2000s, phase one of the deregulation process was implemented. During that time, the only oil marketing companies were Shell, Mobil, Total, Elf, Engine, Oando and few locals. Entry into the sector was restrictive and many locals who wished to set up fuel service stations were not given the license to do so.

It can be seen that although the whole sector is growing, and the share of the three main players has decreased steadily. Since 2013, the number of

Shell stations recorded negative growth. It would be at least 68% of these stations out of a total of 130 stations recorded a negative sales growth, which led to the loss of some 9.0 million liters for the first three months of 2014.

Key players in Ghana's downstream petroleum sector

Ministry of Energy and Petroleum

The Ministry of Energy and Petroleum plays a supervisory role of the sector. Its core duties are policy formulation, planning, monitoring and evaluating energy sector policies. The vision of the Ministry is to ensure secure and sustainable supply of energy for Ghana and beyond. Its goal is to make energy services universally accessible and readily available in an environmentally sustainable manner (Ministry of Energy and Petroleum, 2013).

Ghana National Petroleum Corporation (GNPC)

GNPC is the industry regulator for the Upstream Petroleum Sector of Ghana. 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). Established in 1983 as a State-owned entity, the corporation derives its legal backing from PNDC Laws 64 and 84. PNDC Law 64 mandates the GNPC to undertake the exploration, development and production of crude oil.

National Petroleum Authority (NPA)

The NPA was established in 2005 by NPA Act 691 which mandated it to regulate, oversee and monitor activities in the petroleum downstream industry and where applicable do so in pursuance of the prescribed petroleum pricing formula. (National Petroleum Authority, 2013). The Act also established a Unified Petroleum Pricing Fund (UPPF) whose objectives include guaranteeing regular supply of petroleum nationwide, ensuring that prices of petroleum products include an element that represents estimated cost of distribution and achieving an efficient petroleum products distribution system.

Tema Oil Refinery

Tema Oil Refinery (TOR) Limited the only refinery in Ghana is authorized to process crude oil and market petroleum products. 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). The NPA has also licensed various Petroleum Service Providers to import crude and petroleum products, export, distribute and market them. These include Bulk Distribution Companies (BDC), Oil Trading Companies (OTC) and OMCs.

Bulk Oil Storage and Transportation Company Limited (BOST)

The Bulk Oil Storage and Transportation Company Ltd (BOST) was incorporated in 1993 as a private Limited Liability Company with the Government of Ghana as the sole shareholder. BOST has the mandate to develop a network of storage tanks, pipelines and other bulk transportation infrastructure throughout the country and to keep Strategic Reserve Stocks for Ghana. BOST has been given an additional mandate as the Natural Gas Transmission Utility (NGTU) to develop the Natural Gas infrastructure throughout the country. Its vision is to be the preferred provider of oil and gas logistics in the West African sub-region.

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, Dominion, Alfa Petrol, Peace, Blue Ocean, TOR, PWSL, Hask and First deep water.

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.

Factors affecting profitability of retail fuel outlets

Ghana oil retail market is increasing at a very high rate, and this can result in overtraded in no time. Eliminating the next comprehensive constraints of the industry, it is imperative for market players to understand the variables that affect the profitability of retail stores and fuel to make investment decisions good and to remain competitive in industry.

Location of fuel retail station

The location of any retail business is an important factor affecting the performance and success of that business (Chan et al., 2005). Location may be important in relation to fuel retail stations if there is a correlation between the location of fuel stations and the demand for fuel. According to Chan et al. (2005), the demand for petrol can be expressly linked to local geographical and demographic factors such as; population, median income, number of cars, proximity to airport, downtown and highways.

Therefore, the location of a fuel retail station in a rural area, for example, should influence a lower demand for petrol than an urban area due to a lower population, lower median income, fewer cars, and poorer proximity to an airport. In this regard, PTT Oil of Thailand indicated that it would close

300 petrol stations in unprofitable locations in rural areas. A long distance between fuel service stations, however, increases the volume of petrol and diesel sold (Hillingdon Times, 2006). In this regard, a review of rural petrol stations in Scotland indicated that, to be viable, these stations should be more than 8 miles to the next petrol station or more than 30 minutes' drive from the edge of a town with a population of 30 000 or more (Scottish Executive Publications, 2006 and Siam Future Development PLC, 2006).

Another important location factor that could affect fuel demand is the accessibility of the site to customers (Lee & Schmidt, 1980). Street intersection sites and corner sites are preferred locations as they offer better access, improved visibility and higher traffic volume (Lee & Schmidt, 1980) and a signalised intersection improves access into and out of the fuel station (Smalley, 1999).

Finally, customers prefer fuel retail stations that are close to work and home and convenience and accessibility to enter and exit is becoming increasingly important (Blum, Foos & Guadry, 1988; Smalley, 1999; Bainbridge, 2000; and Chan et al., 2005). The proximity of a fuel retail station to major routes may also be an important driver of fuel demand (Netz & Taylor, 2002). In this regard, customers attempt to reduce travel time and distance when commuting or traveling longer distances and, therefore, select fuel retail stations which are in close proximity to these routes (Chan et al., 2005). This should be especially valid in Ghana where there is no price differentiation and, therefore, no incentive to travel any further than necessary. Therefore, fuel retail stations located near major routes and highways on route to work or home are more exposed to passing traffic and should have a higher

demand for fuel then fuel retail stations located in residential areas (Netz & Taylor, 2002 and Bainbridge, 2000).

Site of fuel retail station

The site of a retail fuel station is influenced by the visibility and size of the fuel station. The size of the petrol station and the number of pumping bays available is an indication of the convenience of filling at a particular station (Smalley, 1999). Customer convenience is an important variable that has a significant influence on sales volume. Although there are many variables influencing customer convenience, one important factor is the number of pumps that can refuel cars. This provides an indication of the number of cars that can refuel without negatively affecting the traffic flow on the site or delay the refueling time. Customers do not like to wait to refuel and tend to avoid stations where back up problems exist (Smalley, 1999).

The number of pumping bays may provide a good indicator of the number of cars that can refuel without causing back up problems and provide an indicator of the volume of petrol that may be sold. Chan et al., (2005) also confirmed that station characteristics such as the number of pumping bays affects the market share of a particular fuel station and, therefore, the fuel demanded by customers.

The price elasticity of demand of oil

The price elasticity of demand is defined as “the percentage change in the quantity demanded divided by the corresponding percentage change in its price” (Begg, 2000). The application of this theory to the retail fuel industry

proposes that an increase in the fuel price leads to a reduction in the demand for fuel. Considerable research has attempted to identify factors that influence fuel demand, as well as provide insights into the sensitivity of consumer demand to fuel prices changes (Espey, 1996). Fuel price has been identified as one of the key variables affecting the demand of fuel (Graham & Glaister, 2002). However, South African consumers have indicated a relatively inelastic short term demand for fuel because of a lack of alternative transport systems.

It could be expected, however, that higher levels of elasticity could be achieved through a combination of a reduction in the use of vehicles, lift-clubs, the use of public transport, better driving techniques, more regular servicing of vehicles and a shift to more fuel efficient vehicles in the longer-term. In this regard, Graham and Glaister (2002) also highlighted the impact of a better infrastructure and a functional public transport system on fuel demand.

The authors performed an extensive international survey on the response of motorists to fuel price changes that indicated a fairly narrow range for short term price elasticity and a bigger range for long term price elasticity. This research concluded that, in general, international short-term price elasticity ranged between -0.10 and -0.3 and long-term price elasticity between -0.6 and -0.8.

The price elasticity of gasoline in the USA, for instance, was estimated to be -0.15 in the short run and -0.6 in the long run (Bailly, 1999). In South Africa, the Bureau for Economic Research (2003) estimated that the short and long term price elasticity of demand for petrol ranged between -0.21 and -0.51 respectively. All of these results indicate short term inelastic conditions that become more responsive over time. In this regard, short term inelasticity with

respect to petrol in South Africa is illustrated by a 17% increase in the petrol price in 2005 which only resulted in a 0.2% drop in sales of R12 billion (Mbendi Information for Africa, 2005). With respect to diesel, an even more inelastic situation prevails in South Africa and the Bureau for Economic Research (2003) estimated the price elasticity of demand for diesel ranged between -0.06 and -0.18 for both long and short term respectively in 2003.

CHAPTER THREE

METHODOLOGY

Introduction

This chapter presents the methodology used in carrying out the study. It includes detailed description of research tools used to address the questions, building on and refining the list of objectives set out for the study. It highlights the research design, data sources and data analysis technique.

Research design

The study is a single case study of Shell Oil Company in Accra. Research design basically provides the description of the plan in which the research adopted to achieve its objectives. The study adopted quantitative research approach to explain a phenomenon by collecting numerical data that was used to analyze the data. This approach adopted enabled the researcher to compute profitability ratios from secondary data sources for the study.

Sources of data

The study used secondary data obtained from the various head offices of fuel retail stations in Accra. Existing data for a total of 20 shell retail outlets within Accra was reviewed in line with the objectives of the study. The sample size for the study is a purposive sampling method of selecting shell fuel outlets in Accra and twenty (20) retail outlets of shell Ghana were selected by convenience sample method within Accra. The aim of the data sampling was to gather specific data needed to test the research questions and hypothesis in order to achieve and fulfil the purpose of this study. Data such the sales

volume of fuel sold, price of fuel sold, location of retail fuel station, profit of fuel retail station were used to generate other vital values required for this study.

Data analysis

For the research data, Microsoft Excel and STATA were used to analyze the data. Descriptive statistics like mean, standard deviation, representations like tables and charts were used to ensure easy and quick interpretation of data.

Quantitative research methodology attempts to establish relationships between related variables. The study analysis will be undertaken using the panel data regression estimation, generalized method moments, GMM estimation technique utilized in panel estimation that incorporates dynamics to take into consideration persistence in the behaviour of dependent variables over time.

Estimation of revenue (Sales Volume)

For the purpose of this study, the benefits in monetary terms will be assumed to be the sales volume of the fuel which is the volume of fuel sold (Q) measured in liter multiplied by the price of fuel sold (P) in GHC. The total revenue equation is given as;

$$TR = P \times Q$$

Where TR = Total Revenue

P = Price of a litre of fuel sold

Q = Quantity/Volume/Amount of fuel sold.

The Profit identity is used in the estimation of Net profit. This is calculated by deducting the total cost of purchasing the fuel from the total revenue of fuel sold per year:

$$\pi = TR - TC$$

Where π = Profit

TR = Total Revenue

TC = Total Cost

Gross profit margin

A company's cost of sales, or cost of fuel sold, represents the expense related to labour, raw materials and operation overhead involved in its retail activities. This expense is deducted from the company's net sales/revenue volume, which results in a company's first level of profit, or gross profit. The gross profit margin is used to analyze how efficiently a company is using its raw materials, labour and retail operation-related fixed assets to generate profits. A higher margin percentage is a favourable profit indicator.

The formula for Gross Profit Margin is:

$$GPM = \frac{GS - CS}{GS}$$

Where GS = Gross Sales of fuel (revenue)

CS = Cost of sales of fuel Sold

Operating profit margin (OPM)

By subtracting selling, general and administrative or operating expenses from a company's gross profit number, we get operating income. Management has much more control over operating expenses than its cost of sales outlays. Thus, investors need to scrutinize the operating profit margin carefully. Positive and negative trends in this ratio are, for the most part, directly attributable to management decisions. This is where variable costs like electricity will be factored in the computation.

The formula for Operating Profit Margin is:

$$\text{OPM} = \text{EBIT} / \text{GS}$$

Where EBIT = Earnings before Interest rate and Taxes (Operating Profit)

GS =Gross Sales

Net Profit Margin

The formula for Net Profit Margin is:

$$\text{NPM} = \frac{\text{NY}}{\text{GS}}$$

Where NY = Net Income

TS = Gross Sales

Regression model and data variables

Because of the endogeneity problem, the OLS estimate of the variables influencing measures on retail fuel outlet's financial performance. The study therefore estimates the following basic regression:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \varepsilon$$

Where;

Y = Average Annual Sales volume

X_1 = Size score

X_2 = location score

α = Constant

β_1, β_2 =Regression Coefficients

ε = Error term

Using Throughput Sales Volume as Proxy for Profit.

The profit of the fuel retail station, which is also the sales volume depends on site classification of the twenty (20) stations. The variables used for the study are Location (L) and Site (S).`

CHAPTER FOUR

RESULTS AND DISCUSSION

Introduction

This chapter discusses the results obtained from the analysis in chapter three. The variables that go into the cost component are analyzed and it also analyzes the average sales volume of fuel or revenue of the retail fuel operation unit. The cost ratio estimation, and profitability of the retail fuel outlets at the selected firms over periods of five (5) years is also presented. Finally the results of the variables that influences profitability and sales volume of retail fuel are presented in this chapter.

Socio-economic characteristics of respondents

Table 1 shows the socio-economic characteristics of respondents contacted at the twenty (20) selected retail fuel station in Accra. This comprises academic qualification, professional qualification and number of years spent with fuel station. This information is represented in the form of tables.

Academic and professional qualifications of respondents

The study investigates the academic qualification, professional qualification and the number of years respondents have spent with fuel service station. Table 1 shows that 2 (10%) of the respondents have attained post graduate degree whiles 6 (30%) of the respondents have acquired first degree or diploma qualification. Twelve (12) respondents have attained secondary, training or lower educational qualification, corresponding 60% of respondents.

Eleven (11) respondents, representing 55% had undertaken a professional program while 9 (45%) of the respondents had not. Educated people also have a part to play in the kind of work they do. This suggests that qualified personnel at the station can help improve performance and sales volume at the retail fuel outlets.

Table 1: Qualification and Experience of Respondents

Variable	Option	Frequency	Percentage
Academic			
Qualification	Post graduate degree	2	10%
	First degree/Diploma	6	30%
	SHS/Training/ and below	12	60%
Professional			
qualification	Yes	11	55%
	No	9	45%
Number of years with shell fuel service station			
	less than a year	6	30%
	between 2-5	9	45%
	between 5-9	4	20%
	Over 10 years	1	5%

Source: Field survey, (2016)

Number of years spent with shell fuel station by respondent

From Table 1, six (30%) of the respondents had spent less than a year with shell (retail fuel station); Nine representing 45% of the respondents have spent between 2 and 5 years with shell; 4 (20%) respondents have also spent between 5 and 9 years with the fuel station whilst one respondent corresponding to 5% has spent over ten years with shell. Experienced employees improve quality of service and they also know their job at hand. This suggests that the more years you spend working with shell, the higher you acquire experience. Thus, this will influence profit and sales volume recorded per day.

Number of pump island used by the retail fuel outlets

When obtaining the data, it was found that different fuel stations have different methods of counting the number of pumps they operate. Figure 1 presents the number of pump island used by the retail outlets. It can be observed from Figure 1 that, out of the 20 retail fuel stations contacted, one of them had two pump island representing (5%); 2 (10%) had three island; 11 (55%) stations had four islands whilst 6 (30%) fuel stations had more than four islands. This result proposes that retail fuel stations with more pumps are able to sell more and make more profits than those with less pump islands. Moreover, the number of pumping islands at a retail fuel station will have an effect on the sales volume of the retail fuel station. Therefore, the more the fuel pump islands, the greater the chances of selling more volume of fuel and making profits per day.

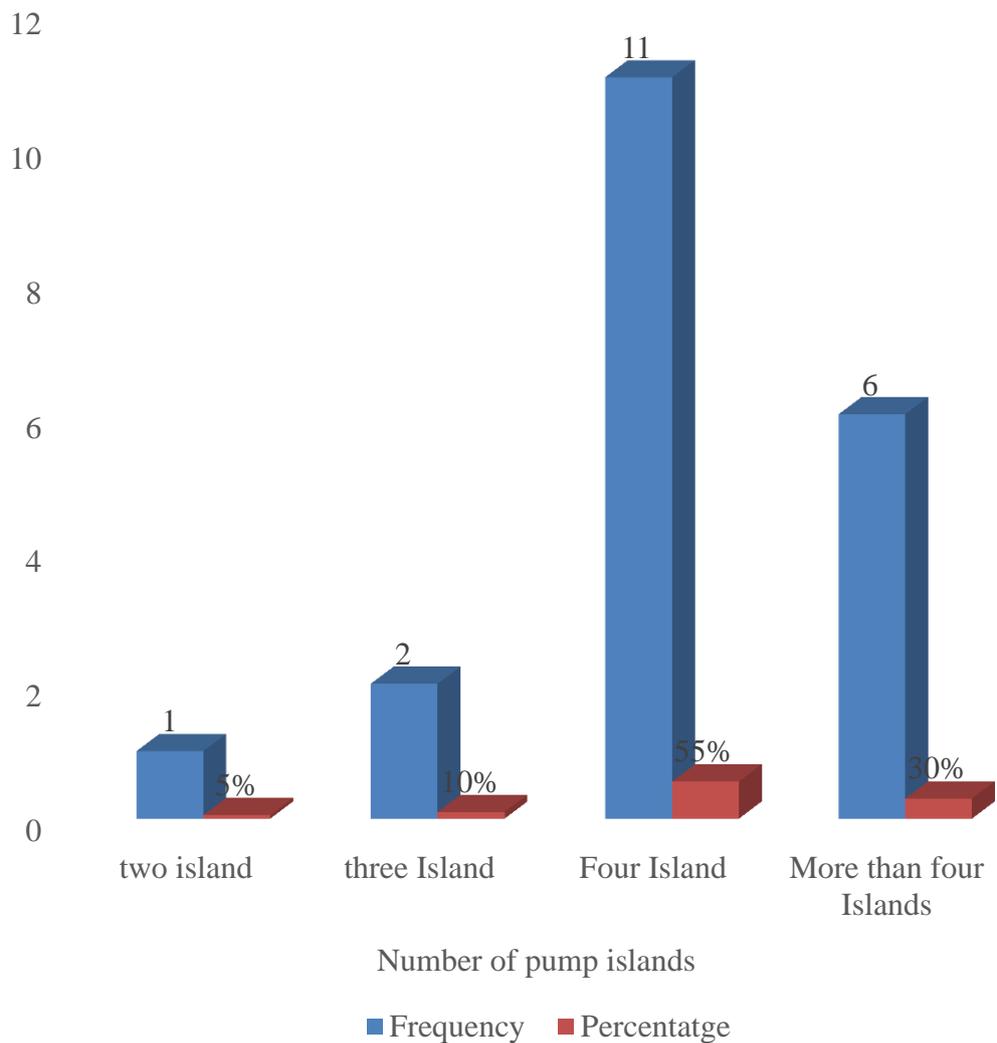


Figure 1: Number of pump island installed at the retail fuel outlets

Source: Field survey, (2016)

Trend of estimated sale volume of the retail fuel outlets

One key variable, average sales volume (from 2010-2014) was proxy for profitability in the long run of the operation. The average sales volume of the 20 selected retail fuel stations recorded in Figure 2 shows an increasing average sales volume of fuel from 2010 to 2014. There was a sharp increase between 2010 and 2012 representing GH¢2,246,947.95 and GH¢2,608,185.55 respectively. This rises to GH¢2,728,101.00 in 2014.

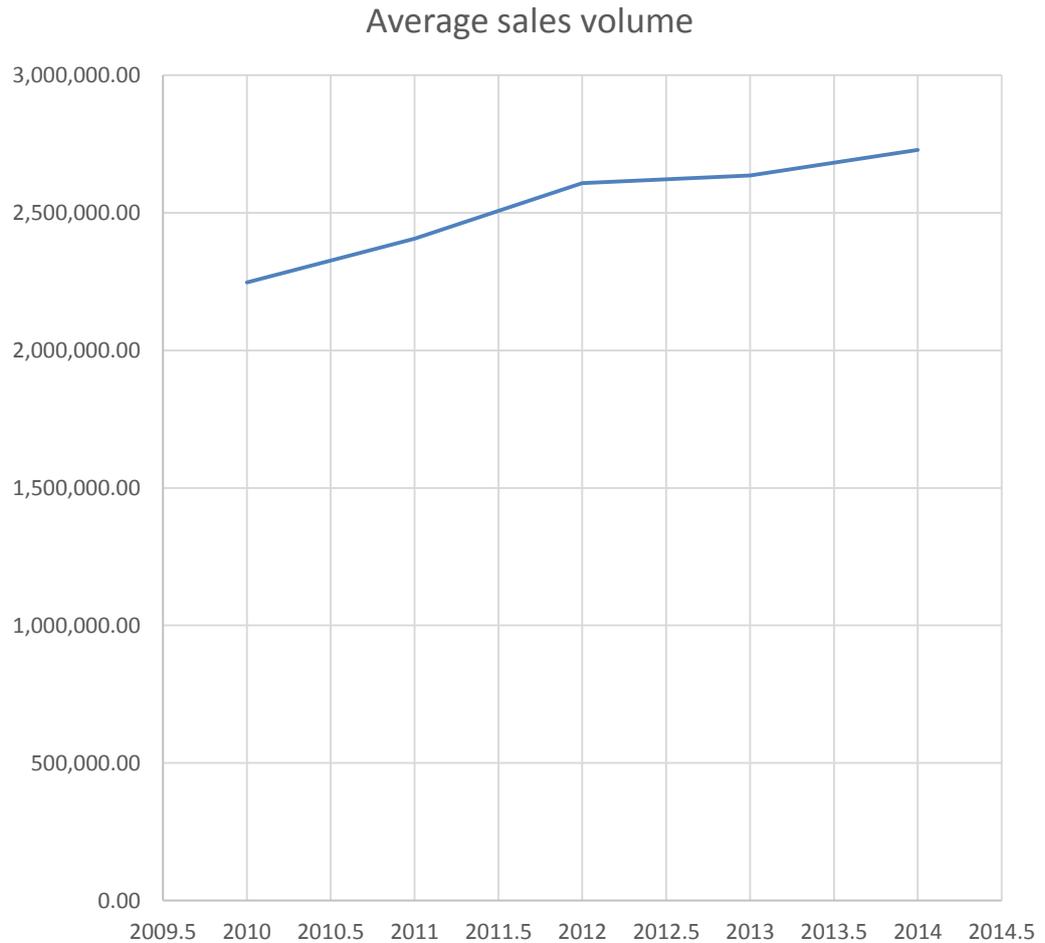


Figure 2: Average sales volume of retail fuel outlets from 2010 to 2014.

Source: Field survey, (2016)

Trend of estimated cost of sales margin of the retail fuel outlets

Figure 3 presents the margin of the cost of sales of retail fuel stations in Accra. In 2011, the cost of sales of fuel recorded 7.96% as against 7.72% in 2012. This shows that there was a decrease in the cost of sales in 2012 but it increased 10.32% in 2013 and it further increased to 13.09% in 2014. The figure shows that the cost of sales of fuel increased from 2012 to 2014. This suggests that profits recorded from 2012 to 2014 would be low and this is risky for investors. Figure 3 is presented below.

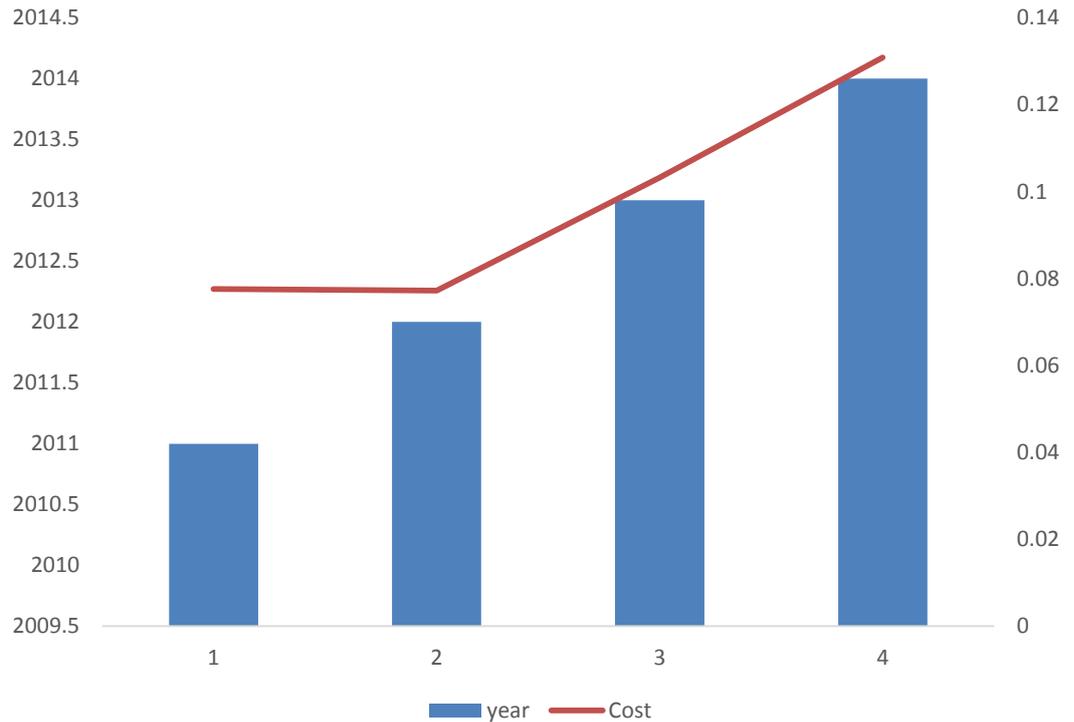


Figure 3: Cost margin of sales of retail fuel

Source: Field survey, (2016)

Estimated profitability

Table 2 shows the variables for profitability measured as the Operating profit margin and the Gross profit margin. Table 2 shows the estimated average of Gross Profit Margin (GPM) and Operating Profit Margin (OPM) for the retail fuel from 2012 to 2014. The Operating Profit Margin recorded in 2011 and 2012 were 3.93% and 4.22% respectively; it increased to 5.62% in 2013 and increased again to 7% in the year 2014. This suggests that managements in the various retail fuel outlet had control over operating expenses than its cost of sales outlays.

In 2011, there was a small marginal increase in Gross Profit Margin from 11.69% to 11.94% (2012). Gross Profit Margin increases again from 15.94% in 2013 to 20.09% in 2014. This results show that Gross Profit Margin

of retail fuel outlets has been increasing at an increasing rate over the past four years. This could be attributed to the variables that influence profitability as described in this chapter. Demand for fuel from 2011 to 2014 could also be price inelastic and the cost of sales of fuel was high over the years, which resulted in lower profit margins.

Table 2: Profitability Analysis of Retail Fuel Outlets

Year	Operating Profit Margin	Gross Profit Margin
2011	3.93%	11.69%
2012	4.22%	11.94%
2013	5.62%	15.94%
2014	7.0%	20.09%

Source: Field survey, (2016)

Factors affecting the sales volume of fuel outlets at the shell fuel service station

A number of variables were identified as factors affecting sales volume of the fuel at the shell fuel service stations. The respondents at the selected retail fuel station were asked to indicate the factors that affect or cause a decline in their sales volume. Table 3 shows that 4 (20%) and 9 (45%) of the respondents “strongly agree” and “agree” respectively that ‘poor location’ is the reason for the decline in sales volume of the fuel whilst 6 (30%) respondents “disagree” and 1 (5%) respondent was ‘neutral’. Three (3) respondents (15%) and 6 (30%) respondents “strongly agree” and “agree” respectively that ‘poor visibility of outlets’ causes a decline in sales volume of

fuel; 2 (10%) of the respondents were “neutral” whilst 9 (45%) of the respondents “disagree”. Table 3 also records that 8 (40%) and 7 (35%) respondents “strongly agree” and “agree” respectively that ‘poor accessibility (small size of outlet, small number of filling positions)’ causes a decline in sales volume of fuel whilst 2 (10%) and 3 (15%) of the respondents “disagree” and “strongly disagree” respectively. Moreover, 1 (5%) and 12 (60%) of the respondents “strongly agree” and “agree” that decline in sales volume of fuel is caused by ‘Increased number of competitor sites along the route’ but 7 (35%) of the respondents “strongly disagree”. Four representing 20% and 8 (40%) of the respondents “agree” and “strongly agree” respectively that ‘increase people cost’ causes decline in sales volume of fuel; 5 (25%) respondents “agree” but 3 (15%) were “neutral”.

The respondents again expressed their extent of agreement and disagreement to the perceived factors affecting sales volume of retail fuel. The table shows that 3 (15%) of the respondents “strongly agree” that ‘increase cost of utility’ is the reason for the decline in sales volume of the fuel whilst 12 (60%) respondents “disagree” and 5 (25%) respondents “strongly disagree”. Seven (7) respondents (35%) “agree” that ‘Increased outlet maintenance cost’ causes a decline in sales volume of fuel; 4 (20%) of the respondents “disagree” and 9 (45%) of the respondents “strongly disagree”. Table 3 also records that 10 (50%) and 3 (15%) respondents “strongly agree” and “agree” respectively that ‘Increased working capital financing cost’ causes a decline in sales volume of fuel; 2 (10%) of the respondents were “neutral” whilst 4 (20%) and 1 (5%) of the respondents “disagree” and “strongly disagree” respectively. Moreover, 4 (20%) and 5 (25%) of the respondents

“disagree” and “strongly disagree” that decline in sales volume of fuel is caused by ‘Increased in other operating cost’, but 4 (20%) of the respondents “agree” whilst 7 (35%) respondents were “neutral”. However, all the respondents that were contacted said that ‘increased price per liter of fuel’ causes a decline in sales volume of fuel.

Table 3: Factors that Affect Sale Volume of Retail Fuel

Variables	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
Poor locations	20%	45%	5%	30%	
Poor visibility of outlets	15%	30%	10%	45%	
Poor accessibility (small size of outlet, small number of filling positions)	40%	35%		10%	15%
Increased number of competitor sites along the route	5%	60%			35%
Increased people cost		25%	15%	20%	40%
Increased cost of utilities (electricity, water etc)	15%			60%	25%
Increased outlet maintenance cost		35%		20%	45%
Increased Working capital financing cost	50%	15%	10%	20%	5%
Increased in other operating cost		20%	35%	20%	25%
Increased price per liter of fuel	100%				

Source: Field survey, (2016)

Site classification

Shell retail fuel stations estimate sales volume for investment decision making to determine their site classification. The variables used for site classification to evaluate the relationship between sales volume and site classification include Location (L) and Site (S). These were classified using a scoring technique from which volume estimates were deduced.

The relationship between average annual sales volume, site and location

It can be seen from Table 4 that, the Sales annual volume in litres from 2010 to 2014 ranged between GH¢ 1,000 (959.16) and GH¢ 7,500 (7211.11) with a mean value of GH¢ 3,117.44 and a standard deviation of 1763.05. On the other hand, the location rating (1-20) had a mean value of 13.55 with a minimum value of 9 and a maximum of 16 with a standard deviation of 2.19. Finally, site ranged between 5 cars filled simultaneously and 17 with a mean value of 11.3 and a standard deviation of 3.56.

Table 4: Mean value of Sales, Site and Location

	Sales Volume-Annual	Site	Location
	Average (Ghc '000)		
Mean	3117.44	11.3	13.55
Standard Deviation	1763.05	3.56	2.19
Minimum	959.16	5	9
Maximum	7211.11	17	16

Source: Field survey, (2016)

From table 4, a mean of 3117.44 for sales suggests that annual sales volume of the firms are relatively moderate given the minimum and maximum values. However, a standard deviation of 1763.05 indicates a variability in annual sales across the sample. Although, Graham and Glaister (2002) find that there exist a high demand of oil as supported by high sales, this study differs from their work on the bases of the fact that the mean annual sales volume was moderate as supported by the report from Mbendi Information for Africa (2005).

In terms of site, a mean value of 11.3, found between minimum (5) and maximum (17) indicate that site of retail companies are large with low variability (standard deviation =3) across the sample. Average location (mean=13.55), on the other hand, is relatively high. This is in line with the work by Netz and Taylor (2002), who found a relatively high value of average location of retail outlets.

Sales volume and site

Figure 4 shows a positive relationship between average annual sales volume of fuel and site of fuel station. This means that when the level of site in relation to accessibility and visibility of fuel station, increases by one unit score, and the annual average sales volume of fuel will also increase by one. From Figure 4, the plotted points appear to be closely grouped about the line of best fit indicating a high level of correlation between sales volume and accessibility and visibility to fuel station.

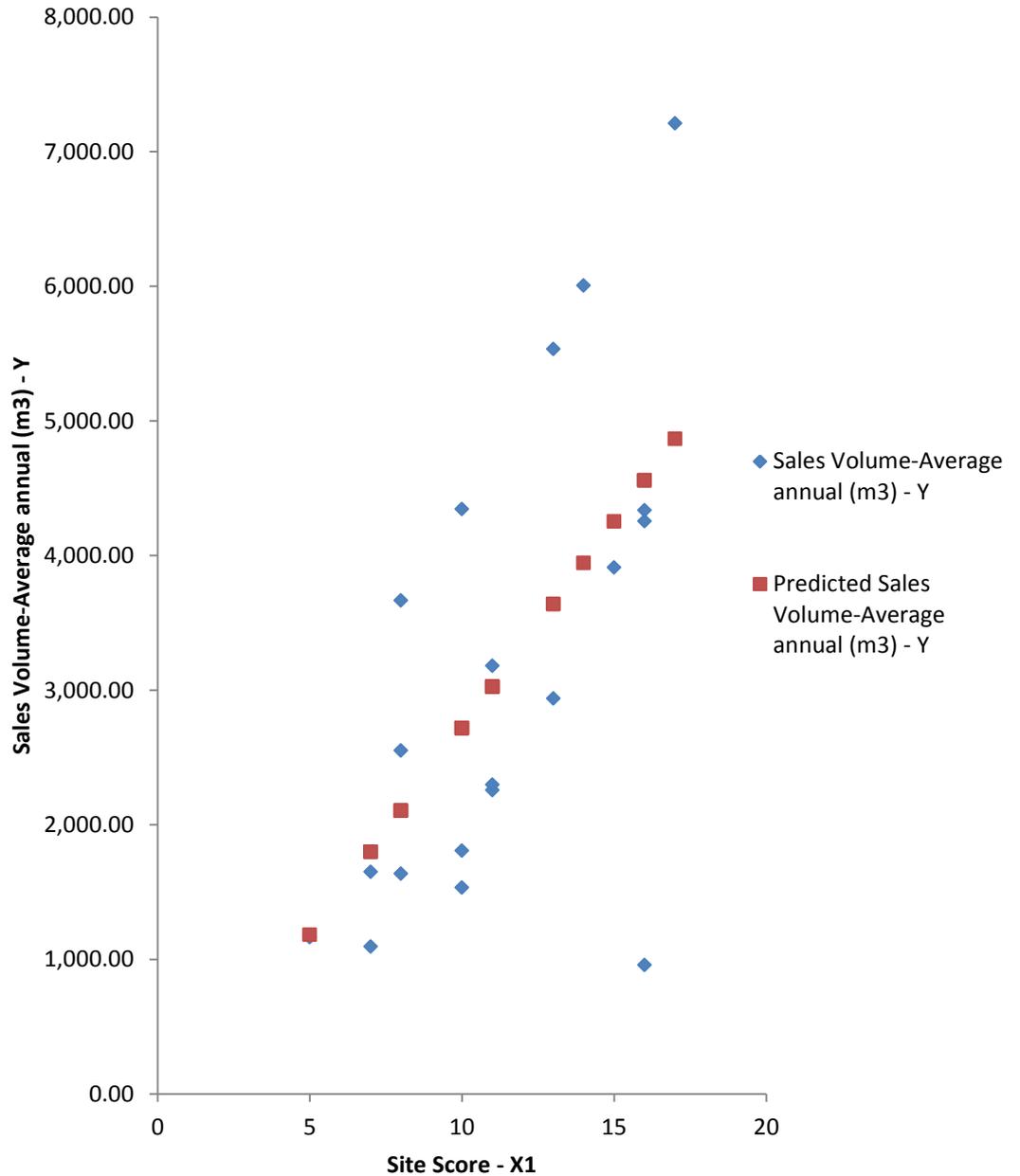


Figure 4: Site score - line fit plot

Source: Field survey, (2016)

Sales volume and location

From Figure 5, there was a positive relationship between sales volume and location. This means an increased in the traffic flow and buying area to the fuel station will result in an increase in the sales volume of fuel. In Figure

5, although the general slope of the scattergram is positive, the plotted points are widely dispersed around a hypothetical line of best fit. The scattergram, therefore, suggests a tentative level of correlation between sales volume and location (traffic flow and buying area) as well as the number of Pump Islands or pumping bays.

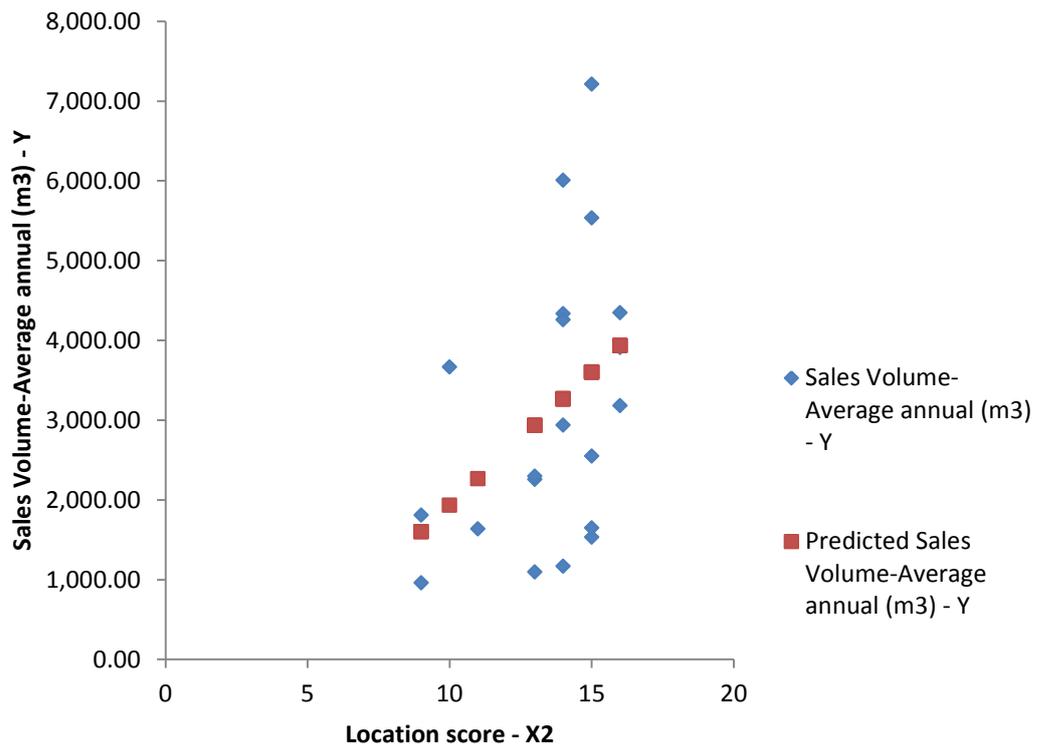


Figure 5: Location score - line fit plot

Source: Field survey, (2016)

As shown in figure 5, the positive relationship between location and the annual sales volume of fuel supports the findings by Bainbridge (2000) and Chan et al., (2005) who claim that users of fuel prefer buying from fuel retailers that are close to them. This reduces travel time and distance of users and pull more clients or users to fuel retailers that are close to them. This

eventually increase the supply of fuel by retailers – thereby increasing the sales volume of retailers. Thus, location is an important factor in increasing the annual sales volume of fuel retailers.

According to Netz & Taylor (2002), fuel retail stations located near major routes on highways of clients on their way home or to the office have a higher demand for fuel. Therefore, proximity to fuel locations increase the sales of fuel.

The variables that influence profitability of retail fuel at the shell fuel stations in accra

The annual average sales volume of fuel was the proxy for profitability. The dependent variable was the average sales volume whilst the size and location scores were independent variables. The average sales volume was regressed on site and location scores of fuel station and the results were tested. The parameter estimates of weighted least squares (WLS) from the linear regression conducted analyze the effect of shell site and shell location on average sales volume of fuel. Table 5 reveals that ‘shell site score’ has a positive effect on average sales volume of the fuel. This means that increasing shell site will result in an increased value of average sales volume of fuel, holding all other factors (like price changes, etc.) constant. It has a significant positive relationship at 5% significant level with a p-value of 0.003. Therefore, we reject the null hypothesis and conclude that there is a significant effect of shell site station on the average sales volume of fuel. Table 5 shows that ‘shell location’ has a positive significant relationship with average sales volume. The positive coefficient parameter estimate suggests that the closer the shell

location to cars or the easier its accessibility, the higher the likelihood of increasing average sales volume. The p-value was 0.049; hence it is significant at 5% significant level. We reject the null hypothesis and conclude that shell location has a significant effect on average sales volume of fuel.

Table 5: Regression Analysis

	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>
Intercept	-4092.09	2030.668	-2.01514	0.059984
Site Score	290.2832	84.43801	3.437826	0.00314
Location score	289.9872	137.2218	2.113274	0.049666

Source: Field survey, (2016)

Dependent variable: Average sales volume of fuel for the shell retail fuel station.

From table 5, the positive relationship between site score and sales volume indicates that more visible, convenient and sizeable fuel retail outlets are, the greater the chance that customers would be attracted to purchase from the fuel station, This inturn, increases the sale volume of fuel which agrees with the work by Chan et al (2005) that fuel station are characterized by convenience, size, number of pumps, and visibility – which have a significant and positive impact on the sales of fuel. Thus, as the various characteritice increase the higher the sales volume of fuel and vice versa.

Location score was also positively and significantly linked to the annual sales volume of fuel. Thus, long distance between fuel service stations,

increases the sales volume of fuel which supports the report in Hillingdon Times (2006). This implies that the managers of the firms ensure that their fuel stations are close to users to attract greater number of clients or customers in order to increase their sales.

Table 6 highlights the regression statistics of the variables. The F-test also helps to reject the hypothesis that, except the intercept, all the coefficients associated with the explanatory variables are equal between them and zero and hence it indicates the overall significance of the model. The R^2 was 51.1% which means that the explanatory variables explained 51.1% of the variation in the average sales volume of fuel. The R^2 value tends to be inflated when the number of independent is more or when the number of cases is large. The adjusted R^2 takes into account these things and gives more accurate information about the fitness of the model. The adjusted R^2 was 45.4%. The F statistic was 8.89 significant at 1% (significant value of 0.0023) and it shows the extent of the overall significant of the regression.

Table 6: Regression Statistics

<i>Regression Statistics</i>	
Multiple R	0.715033
R Square	0.511272
Adjusted R Square	0.453774
Standard Error	1303.019
Observations	20
F-stats: 8.892082	Sig. 0.002275

Source: Field survey, (2016)

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter puts together all the information gathered from the first four chapters. The objectives, literature reviewed, the methodology and the data analyzed in the previous chapters. The summary of findings generated out of the objectives is also presented in this chapter. A conclusion to the project as well as recommendation for further studies is drawn.

Summary of findings

Various findings of the discussion of data analysis emerged, which satisfied the objectives of the study. The findings have been categorized into various subsections to deal with the specific objectives of the entire study and other results which also followed from the analysis of the data. The study combines both the time series and cross sectional data of sales and costs of fuel for the retail shell fuel service stations over the period 2010 to 2014. The study randomly selected twenty (20) shell fuel service stations in the urban setting, Accra.

The sample size for the study included 20 shell fuel stations for 2010 to 2014 data sets of the fuel stations in Accra. The data included the average annual sales volume which comprises the price of the fuel multiplied by the volume of fuel in litres (the dependent variable- a proxy for profit), as well as details of the predictor variables influencing sales volume, namely: the location and the site of fuel station. However, the study makes a contribution

by better quantifying these relationships by the use of quantitative, graphical and case study techniques.

The findings show that the people that were contacted at the various fuel stations had a minimum qualification at the secondary education level with few acquiring tertiary and professional qualification. Most of the respondents have spent over two years in the shell fuel service station; thus, they were those most experienced with their job. Majority of the shell fuel station had at least four Pump Island at the station and they were those who recorded high annual sales volume of fuel.

The findings also highlights an increasing average sales volume of fuel over the five year period (2010-2014) but there were variations with the level of average sales volume across the shell fuel service station. The study recorded an increasing Operating Profit Margin and an increasing Gross Profit Margin from 2011 to 2014. The respondents identified some of the factors that causes decline in average sales volume of fuel. Majority of the respondents were in agreement that decline in average sales volume of fuel is caused by the following perceived factors; poor location of shell fuel station, poor accessibility of the shell station, increased number of competitor sites along the route, increased working capital financing cost and increased price per liter of fuel.

The findings show that fuel stations with greater number of fuel pump Islands recorded high sales volume of fuel and it can be said that they were those more profitable. This suggests that extra pumps do not necessarily equate to extra sales volume and probably inflate the fuel storage costs and overheads of the relevant outlet. It is quite surprising that the importance of

the relationship between the site of fuel station and sales volume was not significant compared to location.

Finally, the purpose of the study is to investigate whether shell site and location variables influence profitability or the average sales volume of fuel. The findings show that average sales volume of fuel has a positive relationship with shell site and location. This means that when traffic flow and buying area of a fuel station are high, sales volume increase; and when accessibility and visibility to the fuel station have a high score, average sales volume of fuel is high.

Conclusions

Since fuel price increases began in the past years, the oil marketing and petroleum industry have earned increased profits. These profits might have resulted from other factors in addition to the increased price of oil. In the retail fuel business, there is a low profit margin due to high cost involved in carrying out the business and it could sometimes be making losses. The higher the cost of investment the lower its profits and therefore what drives profit at the station level is the Volume of sales. When they sell more volume of fuel, they make higher profits. Investing into the retail fuel business requires high investment capital. Therefore a sound investment decision making on the establishment of retail fuel station depends on the projected future cash flows of sales volume of fuel with a positive Net Present Value. The study uses the sales volume of fuel at the shell stations as a proxy for profitability.

The study also attempted to identify certain factors that influence profitability of the retail fuel companies in the urban setting. The research

instrument shows high validity and reliability. This study has provided empirical evidence pertaining to the perception of factors causing a decline in the sale volume of fuel. In conclusion, the objective of this article has been to examine the implications of the variables that affect average sales volume of fuel. Although the intention is not to generalise from this study; nonetheless, the researcher provide useful insights for future direction of policy recommendation to managers of the shell fuel station.

It can be concluded that location and size of the shell fuel station has made only very little positive impact in enhancing higher profitability and average sales volume of fuel among the shell fuel service stations in the industry; as such, there is the need for the implementation of management policy that will mitigates factors that causes decline in average sales volume of fuel.

Recommendations

Based on the findings of the study, the following recommendations are drawn to improve the profitability of shell retail fuel stations in Ghana.

1. Ways of increasing returns and sales volume of fuel must be considered by managers. Suppliers of oil to the fuel stations must relieve the financial burden of fuel station owners by reducing the excessive high cost of rentals they demand for their location. Moreover, managers must find a suitable place convenient to establish their fuel station, particularly on the highways and close to car stations.
2. It is recommended that prospective owners must carefully survey the likely fuel consumption on the basis of location and then choose the

minimum number of pump islands to service this capacity with an option to increase the number of pump islands in the event of sustained additional volumes.

3. Station owners, therefore could monitor the fuel sales per pump per day as a way to manage the efficiency of the attendants and sales volume per day. There is the need for them to follow long range forecasts of their fuel size and location and use this to adjust long term sales volume predictions.
4. Finally, other areas of research identified by this report could include detailed examination into the price elasticity of demand for fuel should be further investigated for proper planning in this sector.

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APPENDIX

RESEARCH QUESTIONNAIRE - DEALER

SECTION I (Background of the Respondents)

1. Academic and professional qualifications

- a. SSE and below b. B.Sc./HND holder c. M.Sc./MBA holder
 c. Professional (Please specify): _____

2. Number of years with Shell

- a. Less than a year b. between 2 – 5 years c. between 5- 9 years
 d. Over 10 years

3. Number of pump islands

- a. two Islands b. three Islands c. four Islands
 d. more than Four Islands

4. Please provide the station’s annual operating cost (covering labor, maintenance, utilities and overheads)

Year	2010	2011	2012	2013	2014
Annual operating cost (Ghs)					

SECTION II (The Possible Causes of the Decline in Volume Sales at the Existing Shell Fuel Service Stations)

3. To what extent do you agree with the following statements as being the possible causes of the decline in volume of sales at the existing Shell fuel service stations? (Where 5 = Strongly Disagree; 4 = Disagree; 3 = Neutral; 2 = Agree; 1= Strongly Agree)

S/N	Variables	1	2	3	4	5
i.	Poor locations					
ii.	Poor visibility of outlets					
iii.	Poor accessibility (small size of outlet, small number of filling positions)					
iv.	Increased number of competitor sites along the route					
v.	Increased people cost					
vi.	Increased cost of utilities (electricity, water etc)					
vii.	Increased outlet maintenance cost					
viii.	Increased Working capital financing cost					
ix.	Increased other cost					
x.	Increased price per liter of fuel					
xi.	Other(s)					