

EFFECTS OF DOWNSTREAM SUPPLY CHAIN CHALLENGES ON THE
PERFORMANCE OF THE PETROLEUM INDUSTRY IN KENYA: A CASE OF
SELECTED OIL MARKETING COMPANIES IN NAIROBI COUNTY

by

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APPROVAL**EFFECT OF DOWNSTREAM SUPPLY CHAIN CHALLENGES ON THE
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DECLARATION

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CASE OF OIL MARKETING COMPANIES IN NAIROBI COUNTY

I declare that this thesis is my original work and has not been submitted to any other college or university for academic credit.

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LIST OF ABBREVIATIONS AND ACRONYMS

GDP	Gross Domestic Product
ERC	Energy Regulatory Commission
MOPM	Ministry of Petroleum and Mining
KIPPRA	Kenya Institute for Public Policy Research and Analysis
KPRL	Kenya Petroleum Refinery Limited
KOSF	Kipevu Oil Storage Facility
KOT	Kipevu Oil Terminal
NACOSTI	National Commission for Science, Technology and Innovations
NOC	National Oil Corporation
OMC	Oil Marketing Companies
OPEC	Organization of the Petroleum Exporting Countries
PwC	Pricewater Coopers Limited
SCM	Supply Chain Management
SOT	Shimanzi Oil Terminal
SPSS	Statistical Package for the Social Sciences

ABSTRACT

This study focused on assessing the effects of downstream supply chain challenges on the performance of companies in the petroleum industry, focusing on oil marketing companies in Nairobi County, Kenya. The objectives were to analyze the downstream supply chain challenges, examine the effects of the downstream supply chain challenges on performance, and propose measures that can be put in place to curb downstream supply chain challenges that affect performance of oil marketing companies. A descriptive research design was adopted, targeting employees of selected oil marketing companies in Nairobi County. Multistage sampling comprising stratified and proportionate simple random sampling was adopted in arriving at the desired sample size of 91. Data was collected using questionnaires and interview guides, and analyzed using the statistical package for the social sciences (SPSS) version 23.0. Study findings revealed that unprocedural tendering systems (88.6%), frequent fluctuation of international oil prices (84%), logistics challenges such as long process cycle (85.7%), and lack of an integrated management process (74.3%) were the major downstream supply chain challenges experienced by oil marketing companies. Major strategies of coping with these challenges included purchasing of high quality products and in bulk (23.6%), outsourcing of services and using of multiple suppliers (21.8%), and partnering with other oil marketing companies (20%). Major effects of the challenges were; reduction in company's competitive advantage (90%), low levels of supply chain integration (88.6%); and reduction in flexibility in the supply chain (80.0%). The study recommends the need for revision and design of policies and regulations with particular focus on controlled competition in the petroleum industry and for oil marketing companies to ensure that they have well-designed integrated ICT systems that coordinate all operations within the company.

DEDICATION

This thesis is dedicated to my late beloved father Mr. Robert Maondo Chola, in memory of his passing away on 21st October, 2018 while I was undertaking this study. I also dedicate the thesis to all my family members for their unwavering moral, social, and spiritual support throughout the process of writing this thesis.

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CHAPTER ONE

INTRODUCTION AND BACKGROUND TO THE STUDY

Introduction

Petroleum also referred to as oil is a key source of energy which has met over 30% demand across the universe since 1990 (Cohen, 2016). It contributes to the economy, development and technology across the world. It is being applied in various sectors such as electricity generation, powering fleets, construction, manufacturing and production among other sectors. 30 billion of containers of oil are used across the world per year (Amponsah & Opei 2013). Petroleum is the predominant product in the world which is used across all sector such in transport, industrial sectors, and commercial sectors (Energy, ICT and Infrastructure Sector, 2018).

In Kenya, petroleum accounts for about 22% of the energy consumed in the country (Ministry of Petroleum and Mining 2017) and it has accounted for 80% of the country's profitable energy necessities. The Ministry of Petroleum and Mining estimates that demand for petroleum products will grow annually by about 5%. Petroleum supply continues to face challenges with instances of product shortages, constrained storage capacities, delays in vessels discharging petroleum products at the port (single jetty), and low evacuation of petroleum products. It is in this regard that the present learning sought to assess the effects of downstream supply chain challenges on the show of the petroleum industry in Kenya using a selection of oil marketing companies in Nairobi County as case studies.

This part of the study provides the contextual of the learning report of the problematic, research goals, and research queries. The chapter further justifies the study, the worth, the scope, limitations and delimitations, and definition of key terms used in the study.

Background of the Study

Petroleum is one of the key economic development factors in the world and the major source of energy (Kimani, 2013). It keeps on the top as one of the major sources of energy, it is consumption growth is averagely about 1.6 million containers per day (Statistical Review of World Energy, 2017). The world's most populated country China accounts for about 22% of the universe's energy usage (World Energy Outlook, 2017).

According to the Organization of the Petroleum Exporting Countries (OPEC, 2009), the petroleum industry can be categorized into three sectors - that is to say: upward stream, middle stream, and downward stream. The upstream involves the acquisition of crude oil by oil companies (Amponsah & Opei, 2017). Midway rotates about the storage and refining of crude oil into consumable petroleum products. The downstream supply chain through the distribution process ensures the advance product is transport to the final consumers

The global supply chain challenges include; constrained storage capacities, delays in vessels discharging petroleum products at the port (single jetty), low evacuation of petroleum products, and fluctuation of oil prices per barrel (Kojima, 2013). Most of the governments in developing countries of South America, Asia, and sub-Saharan Africa control petroleum product prices in their countries (Kojima, 2013). An increase

in petroleum prices in the world market has seen the same transmitted to the domestic market. This has given rise to the need for the government to provide a greater safety net to its citizens by reducing taxes on imported crude oil and guaranteeing price subsidies of petroleum products (Kojima, 2013).

Crude oil importation is a major drain on the economy of many African countries (World Energy Outlook, 2017). As a developing continent, Africa faces numerous supply chain challenges in the normal day-to-day operations of petroleum business which are almost similar to the rest of the world (Saad & Udin, 2014). Among these challenges include constrained storage facilities, inability to process crude/ lack of refinery, delays in the discharge of petroleum products because of a single port of entry, inadequate pipeline capacity, low evacuation of petroleum stocks, stringent government policies, logistical challenges, fluctuating petroleum price tendering and sourcing of oil yields. To thrive in the African oil industry, companies in this sector ought to have a good layout supply chain process that takes into consideration the risk that the business environment within which an organization is exposed, this means that the supply chain design adopted by a company to suit the African market should mitigate the risk (Saad & Udin, 2014).

In Kenya, the Act (cap 308) is the important regulation governing upstream activities in Kenya. It vests the rights of hydrocarbons to the state and giving the cabinet secretary of the ministry of petroleum and mining power (Economic Survey 2018). According to Petroleum Insight (2018), midstream and downstream petroleum activities in Kenya are coordinated by the Ministry of Petroleum and Mining (MOPM) through a process known as an Open Tender System. The distribution of the

product is facilitated by the Kenya Pipeline Company and oil marketing companies are in charge of marketing.).

Kenyan imports were initially guided by authorized warning no. 197 of 2nd December 2003 (Energy Regulatory Commission [ERC], 2015) which required Oil Marketing Companies (OMCs) to mandatorily process crude oil at Kenya Petroleum Refinery Limited (KPRL) and import refined products to meet the balance of demand. However, KPRL has not been in operation since June 30, 2013, because of its obsolescence and since then no crude oil has been procured to date. As a result, all the oil requirements in Kenya are imported as refined petroleum products (Sarkodie & Adom, 2018).

The supply chain of petroleum products in Kenya comprises the procurement of refined petroleum products by permitted oil marketing companies through the open tender system administered by the Ministry of Petroleum and Mining (ERC, 2017). Currently, Kenya imports its entire oil requirement through Kipevu Oil Terminal (KOT) and Shimanzi Oil Terminal (SOT) after the closure of KPRL which has not been in operation since June 2013. Pipeline transportation of oil products is also affected by power outages and thus derails the timely delivery of petroleum products within the country (Kojima, 2013).

The organizational performance incorporates three specific areas of a company's outcomes: financial performance (profits, return on assets, return on investment, etc.); product market performance (sales, market share, etc.); and shareholder return (total shareholder return, economic value-added, etc.) (Pierre, Devinney, Yip, & Johnson, 2009). Studies have been done to measure the performance of the

organization which includes both financial and market criteria. This includes the return on investment, market share, profitability measure, and overall competitive position (Li, 2006).

Based on this background information, this study sought to assess various downstream supply chain challenges experienced by businesses in the petroleum industry Kenya and how they disturb the performance in the sector. Oil marketing companies in Nairobi were sampled as case studies to represent the entire petroleum industry in Kenya.

Statement of the Problem

The oil industry is the world's most complex sector, which renders a range of services across the world such as transportation, heating, electricity, lubricants, and petrochemical products (Osoro, 2016). Whereas the significance of petroleum products to the Kenyan economy cannot be gainsaid, underinvestment in the country's storage, transportation, distribution, and marketing infrastructure has resulted in several downstream supply chain challenges (ERC, 2017). Key among the downstream supply chain challenges include a single primary point of entry for petroleum into Kenya and the larger hinterland served by the Port of Mombasa, inadequate petroleum storage infrastructure resulting in among others a limited operational stock, massive trucking of oil products due to in-expensive pipelines, aged oil infrastructure, inadequate LPG storage, and handling facilities, delays in product evacuation from KOSF due to limited pipeline capacity, and delays in the evacuation at upcountry depots (Odhiambo, 2014; Wachira, 2010). This leads to vessel delays which result in demurrage that is eventually passed on to the consumer in pump price; thus making

the cost of petroleum products to be high in Kenya which results in a high cost of living.

Several studies have been conducted focusing on the petroleum industry both globally and locally. For instance, Siddharth (2008) piloted a study on evaluating petroleum supply chain performance in India and established that market share, use of information technology, and a steady supply of raw materials are important in evaluating the performance. Another study was done by Kojima (2013) on petroleum markets in Sub- Saharan Africa established that petroleum products have micro and macroeconomic effects. Osoro (2016) did a study focusing on the encounters affecting the performance of supply chain systems in the oil industry in Kenya and well-known that that level of skills, cost of crude oil, and proposing arrangements can mitigate fuel shortages through competent staff in the Kenyan context.

Previous researches have been conducted on petroleum. However, there is tiny research done on downstream supply chain challenges and its effect on company performance. This study, therefore, lectured the knowledge hole by establishing the downstream supply chain challenges experienced, the influence of the downstream supply chain challenges on presentation, and the measures that can be bring into being by oil marketing companies to mitigate against the downstream supply chain challenges.

Purpose of the Study

The drive of this study was to assess the effects of downstream supply chain challenges on the performance of companies in the petroleum industry in Kenya. A particular focus was on oil marketing companies in Nairobi County.

Objectives of the Study

1. Establish the downstream supply chain challenges experienced among oil marketing companies in Nairobi County
2. Establish how oil marketing companies in Nairobi County coped with downstream supply chain challenges
3. Examine the effects of downstream supply chain challenges on the performance of oil marketing companies in Nairobi County
4. Propose measures that can be put in place to curb downstream supply chain challenges that are affecting the performance of oil marketing companies in Nairobi County

Research Questions

1. What were the downstream supply chain challenges experienced by oil marketing companies in Nairobi County?
2. How did oil marketing companies in Nairobi County cope with downstream supply chain challenges?
3. What effect did downstream supply chain challenges have on the performance of oil marketing companies in Nairobi County?
4. What measures could be put in place by oil marketing companies in Nairobi County to curb downstream supply chain challenges that affect their performance?

Justification for the Study

Petroleum sector is one of the major sectors which has contributed highly in people's daily life. Regardless of the contribution of the sector toward people and economy it experiences operational challenges. The topic on the downstream supply chain has

not been given weight on the discussion. Majority of the discussion has been concentrated on challenges affecting supply chain management as a whole and has not been narrowed to the downstream supply chain sector. Also majority of the study have been limited to developed countries and one organization. using the knowledge of this study limited to one organization and developed countries in less developed countries such as Kenya maybe of less impact. This is because does not match the challenges experienced in less developed country like Kenya.

To accomplish competent downstream supply chain supervision for improved performance of the oil marketing companies in Kenya, the companies essential to be familiar with and comprehend the trials affecting their downstream supply chain management and the effect on the overall presentation of the company. This study therefore can enable key petroleum industry players to get an improved thoughtful of the downstream supply chain challenges and their effect on overall performance in the industry. Further, speculative needs to expand storage facilities and leverage on price increases can be an outdated practice as most marketers after this study might learn how to reduce stock halts and related challenges, which hinder them to exploit the potential in the sector.

Significance of the Study

The outcomes of this learning can be of important to petroleum businesses, the vitality guiding authority bodies, the government, and all key thespians in the oil sector of the economy. The findings can provide policymakers with viable opportunities to revise the existing policies related to the downstream source chain challenges affecting the performance of companies in the petroleum industry in Kenya such as strategizing in advance. This in turn can benefit policymakers in Kenya with the provision of proactively

making decisions towards the delivery of service by petroleum companies at the right time, at the right charge, of the right value, the right amount, and from the precise source. This can mitigate oil shortages.

Oil marketing companies can also use the findings of this study and re-adjust their supply chain in a manner that can sustain the flow of products without facing stock-outs, or increased prices that interfere with demand or supply of the products. Through this research, regulatory authority can establish policy measures to implement to promote a conducive external business environment as well as ensure good petroleum product quality and protect consumers from inflated prices.

Oil marketing companies can also use the study findings to identify challenges and implement measures for the effective use of supply chain strategies to archive supply performance and streamline the supply chain while reducing the cost of operations and meet consumer demand at their purchasing power.

Finally, yet importantly, the verdicts of this learning can contribute to the academic discourse in the field petroleum productiveness by providing facts to the existing knowledge gap on the effects of downstream supply chain challenges on performance in the petroleum industry. Therefore, future scholars and researchers can have a point of reference when researching the energy sector.

Assumptions of the Study

The study operated on the following assumptions:

1. The information given by the respondents was honest and truthful
2. That there would be an tolerable trial size for the study
3. The researcher would obtain the required clearance from the research regulatory bodies and the selected oil publicizing companies to embark on the research

Scope of the Study

The learning was restricted to companies in the petroleum industry in Kenya with a particular attention on oil marketing companies in Nairobi County. The learning focused on oil marketing companies located in Nairobi County because Nairobi is the capital city and many of the oil marketing companies operate in Nairobi County compared to other regions of Kenya. According to ERC (2017), there were 83 registered oil marketing companies in Nairobi. The study respondents were suppliers, distributors, managers, and workforce of the lubricant publicizing companies who are straight involved in the supply chain. The study specifically focused on the effects of downstream source sequence challenges on routine in the petroleum production. It particularly looked at how downstream supply chain challenges contribute to the routine of corporations in the oil production in Kenya especially those in Nairobi County.

Limitation and Delimitations of the study

1. The research focused only on oil marketing companies in Nairobi County with a particular focus on downstream supply chain challenges only. This was due to period and monetary limitations. The researcher countered this by ensuring that the downstream sector in the petroleum industry represented the entire industry as much possible through the use of an adequate representative sample from the sector and asking questions that represented the entire oil sector.
2. The study was limited to accessing information from the staff, managers, and supplies of oil marketing companies who are directly involved supply chain systems of their respective companies. Some of the plaintiffs were not alacritous to disclose some info due to security and competition reasons. To mitigate this,

the researcher made official communication with the administration and management of the selected oil marketing organizations in Nairobi County and confirm to them that the information their staff, suppliers, and managers provided as private and used for educational uses only. Further, the researcher provided legal documents from relevant authorities to prove that the research is for academic purposes only.

Definition of Terms

Petroleum: A naturally occurring, raw petroleum product composed of hydrocarbon deposits. Raw petroleum can be advanced to make useful products such as diesel, gasoline, and petrochemicals (Pearce, Dan, & Robinson, 2012). For this study, the term refers to refined crude oil products such as gasoline, diesel, and various forms of petrochemicals that are at the consumable stage.

Supply chain: It is defined by Honcharenko (2013) as the combination of various business entities includes manufacturing suppliers, middlemen, and retailers work together to convert raw material to the final product. For this study, it is used to refer to an integrated process whereby suppliers, distributors, and retailers in the petroleum industry work together to store, transport, market, and distribute petroleum products.

Supply chain systems: Refers to structures in place that help end-user goods firms to shape top-routine source manacles. It optimizes operations, possessions, and administration in all areas, using innovative methods and real-world know -how (Kojima, 2013). For this study, the term refers to the organizational structures that oil marketing companies have put in place to build top-routine distribution series in the petroleum industry.

Tendering: the procedure followed when carrying out a development project and involves giving quotations from the various player (Taylor, 2014). In this study, the term refers to the process contract mostly followed by oil marketing companies especially when wanting suppliers, transporters, distributors, and marketers of the oil products such as premium motor spirit (PMS) or gasoline, gas oil, jet fuel, illuminating kerosene, gas oil, liquefied petroleum gas (LPG) and fuel oil.

Organizational performance: the organization's ability to fulfil its goals comprehensive administration, sturdy authority, and a determined rededication to attaining outcomes (Mahapatro, 2015). It is simply how the organization's wellbeing to achieve its goals. (Yamin, 1999). For this study, the term refers to the ability of a company in the petroleum industry to fulfil its goals and objectives through effective supply chain management especially at the downstream level.

Summary

This part of the study has presented the following key areas; introductions, contextual of the study, research problem and drive of the study. Further, the study outlines the objectives of the learning and investigation questions. Also validation, assumption, scope, limitation and delimitation, definition of key terms of the learning was presented under the section. The next part of the study will present the writings analysis of the learning.

CHAPTER TWO

LITERATURE REVIEW

Introduction

Study's focus was on the effect of downstream supply chain management challenges on performance of organizations in the petroleum industry of in the petroleum industry in Kenya using oil marketing companies in Nairobi County as the case study. In this chapter, a review of the relevant literature from books, periodicals, and progress reports on the petroleum industry, downstream supply chain challenges and its effects in the petroleum industry, measures to curb the downstream supply chain challenges, and performance of companies in the petroleum industry. The review was done under four sub-themes as guided by the study objectives; downstream supply chain challenges experienced among oil marketing companies, ways of coping with downstream supply chain challenges among oil marketing companies, effects of downstream supply chain challenges on the performance of oil marketing companies, and measures that can be put in place to curb downstream supply chain challenges affecting oil marketing companies. The literature reviewed was categorized into general literature and empirical literature. Besides, the chapter also presented the theoretical and conceptual frameworks that guided the study.

Theoretical Framework

A theory refers to an overall viewpoint from which one sees and take to mean the empirical phenomenon in the world in establishing a relationship between two or more variables (Abend, 2008). Theories are referred to as deliberations about how 'reality' is 'socially constructed'; the systematic position of sociology or the 'relativity' of morals (Abend, 2008). A theoretical framework lay down a theory or theories

about facets of humanoid effort that can be valuable to the phenomenon under study (Brondizo, Leemans, & Solecki, 2014). The theoretical framework is made up of main beliefs, hypotheses, thoughts, and inhabitants of a theory (Grant & Osanloo, 2014).

Tendering Theory

According to Runeson and Skitmore (2009), tendering theory originates from two papers: *A Competitive-bidding Approach* (Friedman, 1957) and *Request Approaches and Potentials* (Gates, 1967). Friedman's paper indicated profit is expected to be maximized from single tender where every bidder submits one closed bid at the same time. The selection is done based on make-up which meets value of profit. As long as there has been an adequate number of earlier come across, making it easy to estimate the likely hood of winning with diverse mark-up in contradiction of respectively contestant (Runeson & Skitmore, 2009). Gates' paper of 1967 explains the plans of Friedman of single bid into a broad .profit maximizing valuing model for tendering (Runeson & Skitmore, 2009).

According to the Gates (1967) proclaimed that previous encounter can be used to measure the possibility of winning the tender. Gate turns the single bid into a general strategy which have broad applicability. The decision by gate has supported the model and changed it to economic model for the price willpower of the construction project (Runeson & Skitmore, 2010). The purchaser should choose the mark-up on the cost that make best use of the anticipated cost of the profit which is the product of the mark-up and the likelihood of winning the agreement (Tseng & Chiu, 2013). The theory of tendering is a details of attainable wisdom. Wisdom, if expected for or theorized as a maxim, is about outcomes, which if attained, will have suggestions that,

at least in standard, can be detected, tried and confirmed, or fabricated (Styles, Schoenberger, & Galvez-Martos, 2013).

Despite marketing being the final stage of the supply chain it also responsible to give out marketing forecasting information. The number of demand comes from the previous statistics, onward trade statistics, macroeconomic pointers, Fact of Sales scheme, advertising effort, and metrological effort. Accuracy is highly encouraged since a small mistake may bring in more expenses (Tseng & Chiu, 2013). Therefore, it's imperative to say that a priority dispute that philosophies like tendering theory that lay down reasonableness and can as well be expressed in a normative means as choice guidelines cannot be expressive or optimistic is unacceptable. Such a quarrel must be empirically resulting. The tendering theory specifies a widespread intensification impartial (Delai & Takahashi, 2013).

This study's focus was on the challenges experienced in the downstream supply chain in the petroleum industry. One of the aspects of downstream supply chain management is the tendering process. The tendering theory informed the study on the downstream supply chain, especially the tendering process of petroleum products that are or 'ought to' be performed. It further informed the research with information on the rationality of in effect downstream supply chain process through the minimization of the challenges experienced.

Theory of Performance

Performance theory first appeared in 1977, as *Essays on Performance Theory* by Richard Schechner, revised in 1988, and final edition in 2003 (Schechner, 2003). The rationale of performance theory is that people are skilled in astonishing activities,

which happen in day-to-life. Subsequently, well-intentioned activities are shaped as of elevated performances, the performance theory can be applied in many learning circumstance (Elger, n.d.). For instance traditional circumstances the theory enlightening learning in workshops, reading rooms, other learning places. In non-traditional contexts, the theory updates in academic advising departments, research groups, colleges, and self-development. In an organizational learning context, the theory updates learning through measuring organization performance levels (Elgar, n.d.).

Schrettle et al. (2013) argued that the theory come up with 6 foundational concepts to form aground to explain performance and improvement of an organization. Valued outcome means to perform. Performance are not all equal, for instance ‘Full performance’ comprises competence level that produces originality. Schrettle et al., (2013) also observed that the same time performance theory request for greater concentration context. There is need to establish how performance theory can help us to continuously debate and increase in value what it means to be human and to give communication to our exists common plan outline, and then by equating it to timeliness service delivery in the petroleum industry, to avoid often oil shortages through proper forecasting and maintenance of stock levels (Agami et al., 2012).

About this study, the theory of performance was considered relevant in understanding the effect of the downstream supply chain challenges on the performance of companies in the petroleum industry in Kenya. This is because this theory is anchored on the performance of a company. Therefore, the two theories were relevant to this study since the tendering theory-informed on the downstream supply chain process

while the theory of performance informed this study on the performance of oil marketing companies.

General Literature Review

This section provides general literature from books, periodicals, and progress reports on the petroleum industry, supply chain in the petroleum industry and downstream supply chain challenges in the petroleum industry. The section also discussed general literature on the effect of downstream supply chain challenges on the performance of companies in the petroleum industry, measures to curb downstream supply chain affecting performance among organization in oil sector, and performance actions of companies in the petroleum industry.

The Petroleum Industry

The petroleum sector undertakes the international practises of purifying, transferring (often by oil tankers and pipelines), and marketing oil products (Matusov & Brobst, 2013). Fuel and gasoline are the largest product of petroleum. Also chemical product such as fertilizer, plastics, Pharmaceuticals and solvents are the outputs of petroleum

Internationally, per year 30 billion containers of oil are used. The projection shows that the consumption of energy will increase by 53% by 2035 (Franzosi et al, 2013). North America uses 40% of energy, Middle East consumes 53%, Both Europe and Asia consume 32% of energy, and Central and South America consumes 44% of energy.

Africa's petroleum history bounces throughout numerous eras, in some places it is even a century old. At the moment, Africa has about 500 petroleum firm which participates in African hydrocarbon exploration. According to figures from US EIA, Africa's proven oil reserves have grown by nearly 120% in the past 30 years or so, from 57 billion barrels in 1980 to 124 billion barrels in 2012 (Kimaiyo et al., 2015). Also, it is estimated that at

least another 100 billion containers are offshore Africa, only waiting to be discovered. In turn, Africa's proven reserves of natural gas have grown from 210 trillion cubic feet (tcf) in 1980 to 509 tcf in 2012, representing growth of over 140%.

Downstream Supply Chain in the Petroleum Industry

Petroleum industry is one of the multifaceted sector compare to other sectors (Hussain et al., 2006). As indicated earlier, it is categorized into three different, yet closely related, major segments: the upstream, midstream, and downstream supply chains. The upstream involves the investigation, predicting, production, and logistics management of distributing crude oil from rural situated oil shafts to processing plant (Hussain et al., 2006). The midstream comprises storing, purifying, and transportation of crude oil into consumable petroleum products (Amponsah & Opei, 2013). The downstream sector includes the purifying of petroleum crude oil, processing, and purifying of raw natural gas as well as the marketing and supply of end out to the final consumers worldwide (Amponsah & Opei, 2013). This study focused on the downstream supply chain segment using oil marketing companies as the case study.

Downstream Supply Chain Challenges in the Petroleum Industry

The petroleum industry has been experiencing the challenges for long period. The challenges affecting the growth and output range from government regulations, political issues, and competition (Kim, Kim, & Park, 2015). Due to the scramble for resources, many operators in the petroleum industry have determined to see the sights and produce in some of the most unfriendly and tough surroundings, which in turn tend to be expensive. Also the fears of not meeting the goal and levels of production due to the scarcity of the natural resources (Hou, Xiong, Wang, & Liang, 2014).

However, the reality is that scarcity of resources is not the cause since there is still discoveries of oil across the world (Kinyua, 2014).

There were various supply chain challenges experienced in the petroleum sector in Kenya before the enactment of the National Energy Policy (NEP) of 2004 (ERC, 2017). The management noted these supply chain challenges in its energy strategy controlled in Session Paper No. 4 of 2004 and suggested a appraisal of the Petroleum Act Cap 116 to introduce new regulation to protect electricity, petroleum and renewable energy, namely, the Energy Act No. 12 of 2006 (ERC, 2017). The new legislation also provides that a single energy segment controller ought to control renewable energy, power, downstream petroleum and other form of energy.

Generally, there are various downstream supply chain challenges experienced by oil marketing companies facing which can be categorized as follows: international petroleum prices, tendering systems, logistical challenges, and integrated process management challenges.

International Petroleum Prices

There is no specific market price for oil product. This is due to different grade of petroleum. The prices are determined through market survey, notably Brent and West Texas Intermediate (WTI) (OPEC, 2018). Brent produced in North Sea accounts to around 1% of word's production of oil but two-third of physical trade in oil uses Brent as reference price, (Miles, Huberman & Saldana, 2014). WTI is a United States product, and it has dominated the futures market is produced in the United States and accounts around two-third of the future trading (Sidola, Kumar, & Kumar, 2012).

The pricing for most physical market oil trade is formed through these market survey and benchmarks. For oil businesses take on in the commercial market, or transferred via term agreements between buyers and sellers, agreements lay down the pricing instrument that will be used to compute the value of the shipment (Miles, Huberman & Saldana, 2014) this impact the supply chain process hence affecting downstream performance of the oil marketing organizations performance. So-called 'formula' pricing is the most mutual way and it mechanism, and it an presents the price of a contracted cargo to a benchmark price, with a number of price differences then added or deducted (Topal, 2014).

These benchmark prices used in formula pricing are usually based on either (i) 'spot' prices determined by other scholars or (ii) prices determined in futures markets. Companies in petroleum industry often reference more than one benchmark price depending on the final destination; for example, Saudi Aramco typically employs the Brent benchmark to price oil exports to Europe, Dubai-Oman for exports to Asia and the Argus Sour Crude Index for exports to the United States (Saad, Mohamed, & Hasnan., 2014).

Saad et al. (2014) argued that crude oil pricing background is complicated. The international crude oil trade is at present valued according to the values of a handful of benchmark crudes, which make up less than 5 percent of total crude oil produced (Barrow, 2013). On the other hand, Barrow (2013) noted that there is declined of Brent production. Industry and the controllers are working together to ensure pricing is determined transparently (Barrow, 2013).

Tendering Systems

Tendering process is the key function in procurement. The process helps the organizations and government to ensure transparency, efficiency, responsibility, effectiveness in procurement functions. Various sectors includes international development community and government recognize there is need of existence of a satisfactory state procurement system which helps to increase efficiency of use of public funds (Topal, 2014). Under the sponsorships of the combined World Bank and Development Assistance Committee (DAC) procurement round table creativity, evolving countries, and two-sided and many-sided givers operated together to advance a set of tools and principles that guide developments in procurement systems and the outcomes they produce (Addy, 2012).

As per the stakeholders in this process there is need for assessment which will provide the background upon which the government can come up with a plan to improve its procurement system (Creswell, 2014). Improving the procurement system to meet the international standards is a long term goal enabling the state to effectively manage the public funds to meet its obligations (Creswell, 2014). The primary objective is to support the capacity development in procurement (Cheng, 2014).

Vibrant meaning of the acceptable procurement procedure and the condition beneath which the procedure applied should be included in the law. Also the procedure on how less competitive procedure can be applied should be well defined by the law. Fractioning of agreements to evade exposed competition must be banned (Silva, 2013). The hierarchy of the legal instruments where acceptable procurement is reasonably controlled to minimize the use of methods that limit competition. This indicator assesses whether: a) the legal framework includes requirements to publish

contract awards as a matter of public interest and to encourage transparency; b) there is a wide and easily easy to get to publication of business opportunities; and, c) there is adequate time provided between the publication of chances and submission date, consistent with the technique and complexity of the procurement, to prepare and submit proposals (Topal, 2014).

The time between publication of the invitation for prequalification applications, or an open tender and the submission of proposals relates to the complexity of the procurement and the level of competition expected (Cheng, 2014). If foreign bidders are expected to compete, this is a factor to consider. Sufficient information should be provided in the tendering document to establish ground for transparency in awarding process (Wernet, 2014). Too much information and documentation requirements are considered to be expensive and can lower competition of possible bidders based on excess requirements (Cheng, 2014).

Logistical Challenges

The logistics activities and service is among the major sector which influences the performance of the oil marketing firms (Barua, 2010). Using information technology is also a significant facet of the management of the supply chain (Morton, 2013). The organization must integrate its function from the procurement process to the delivery. In oil marketing firms there is the disintegration of the supply chain functions which has contributed to the high cost of operation which has affected the pricing of oil and petroleum (Morton, 2013).

In the petroleum industry, Barua (2010) noted that the logistics involved are highly inflexible thus leading to logistical challenges. Transportation, supplier issues, delays are among the challenges experience in logistics management. Additionally, the main

mode of transportation which used to carry out logistics are either trucks, ships, railroads, or pipeline (Morton, 2013). In most cases shipment involves many modes of transportation before the final destination. "Very limited businesses 92 deal with that kind of density in shipping," said Doug Houseman, a senior manager at the referring firm Accenture (Morton, 2003, p. 31). Such transportation challenges may bring up delays leading to long lead times. Hence, bearing in mind the inflexibility involved in the process, meeting the expansion view of oil demand and it's derivative while keeping high service-levels and efficiency is a major challenge in the petroleum industry.

In Kenya, Barua (2010) found that there are rail, road, lake, and pipeline logistical challenges in the petroleum industry. The challenges include; the capacity difficult, poor infrastructure, leadership issues, goods transported by pipelines and rails they have to pass through road to reach the final consumer but not linked properly, the road tanker charges are reliant on largely on the tanker operating and repairs expenses and this expenses are mostly influenced by the price of fuel used by the tankers and the status of the roads, poor late transport system.

Integrated Process Management Challenges

Integrated process management is very important in the petroleum industry (Ikram, 2004). The process is very crucial from the procurement of raw material to the final product. "Manufacturing competence alone does not ensure a competitive advantage anymore," said Pretorius, president of BASF's petrochemicals division (Whitfield, 2004, p. R12). In oil marketing firms there is the disintegration of the supply chain activities which has contributed to the high cost of operation which has affected the pricing of oil and petroleum (Coia, 1999).

Coping with Downstream Supply Chain Challenges in Petroleum Industry

According to Barua (2010), to cope with various challenges in downstream supply chain operation the oil organizations involves in numerous coping practices such as benchmarking, strategic planning, integration, collaboration, technology application and involving third part logistics. Barua (2010) further found that oil marketing companies have systems that are supporting supply chain management: E-business, supplier relationship management (SRM), and Warehouse Management Systems (WMS).

Hull (2011) designed a data flow diagram (DFD) to help the Alaskan North Slope Oil Ltd cope and manage supply chain challenges. The DFD helped Alaskan North Slope Oil Ltd to improve supply chain communication flow dependability. Hull (2011) noted that the DFD helped Alaskan North Slope Oil Ltd to be aware of the benefits of the relationship between settings up and send off. The overall performance was improved by the use of DFD which scrutinize the flow of information. Moreover, Hull (2011) pointed out that the basic DFD developed gives a pattern for show off any logistics and supply chain activities. This implies that the DFD can be implemented by oil marketing companies to help them cope and manage the downstream supply chain challenges they would be facing.

Morton (2013) proposed that there is a need for oil companies to have advanced technology to cope up with supply chain challenges such as security. Due to the hazardous product shipped by the oil firms, the supply providers and clients need be aware of the location of shipment (Morton, 2013)

Outsourcing is an additional way of coping with supply chain challenges such as logistical challenges. Through outsourcing logistics functions, oil marketing organizations can manage their supply chain challenges such as high costs as a result

of logistics involved in transporting and distributing petroleum products to consumers (Morton, 2013). The outsourcing happens when business ownership functions are transferred from the company to the suppliers reliant on third-party services logistics companies to manage their supply chains (Collins, 2009). Oil firms have taken outsourcing steps ahead by allying and collaborating with their competitor as one way of outsourcing their logistics functions (Barua, 2010)

Today the oil firms across the world are applying swapping techniques in different ways: shipping trade off, business trade off, and asset trade off. The supply chain includes the process, the dealers, transporters, storerooms, merchants, and the customers (Chopra & Meindl, 2008). The concept of a supply chain is important for the firm's revenue growth. Consequently, Supply chain strategies can enable the firm to save about 10% of its operation cost (Barua, 2010). Also, other sectors such as manufacturing and service provider have been applying the supply chain strategies.

Effect of Downstream Supply Chain Challenges on Company Performance

The most cost-effective and efficient to operate and maintain supplies of crude oil is by reducing lead time, minimising the production costs and distribution costs. Logistics play a key role in supply chain network and represent a great challenge to the performance of supply chain (Mwale, 2014).

The challenges arise from downstream supply chain affect both the competitive advantage and performance the organizations (Mwale, 2014). The competitive advantage is affected through product quality, innovation, lead time, price and delivery (Mwale, 2014). The past studies have shown that the various downstream

supply chain facets (price, quality of products) affects the competitive advantage of the organization.

Lack of postponement or delay strategy in organizations decreases the suppleness in the supply chain and creates imbalances in global efficiency and customer responsiveness (Van Hoek, Harrison, & Christopher, 2001). These abilities will, in turn, improve the overall performance of the organization (Mentzer & Konrad, 1991). The high level of customer satisfaction, economic performance, good relationship, and loyalty can be achieved to competitive advantage. High consumer loyalty on certain brand experiences fewer competitive shifting hence increases the sales volume and profitability (Moran & Gossieaux, 2010).

Measures to Mitigate against Downstream Supply Chain Challenges

Literature review reveals that there are various measures that can be put in place to ensure effective downstream supply chain in the petroleum industry. Gunaseken and Ngai (2014) stated that the effective supply chain is achieved by an organization through managing and integrating key element of information into their supply chain systems. Therefore, to achieve effective supply chain integration in the petroleum industry, companies need to implement information technology, which will ensure that the companies gain competitive advantage through numerous supply chain dimensions such as quality, cost, flexibility, delivery and profit (Gunaseken & Ngai, 2014).

According to Stuart (2014), companies should adopt strategic supply chain relations. This is the long term relationship between the organization and its suppliers. It is designed to leverage the strategic and operational capabilities of individual participating companies to help them achieve significant ongoing benefits. A

strategic partnership emphasizes direct, long-term association and encourages mutual planning and problem solving efforts (Stuart, 2014). Such strategic partnerships are entered into to promote shared benefits among the parties and ongoing participation in one or more key strategic areas such as technology, products, and markets. The strategic partnerships with suppliers enable organizations to work more effectively with a few important suppliers who are willing to share responsibility for the success of the products. Suppliers participating early in the product-design process can offer more cost effective design choices, help select the best components and technologies, and help in design assessment (Wisner, 2012). Strategically aligned organizations can work closely together and eliminate wasteful time and effort. An effective supplier partnership can be a critical component of a leading edge supply chain.

Companies should have customer relationship in order to achieve effective supply chain management (Stuart, 2014). Customer relationship comprises the entire array of practices that are employed by the company for the purpose of managing customer complaints, building long-term relationships with customers, and improving customer satisfaction. Also, Wisner (2012) consider customer relationship management as an important component of ensuring effective supply chain management practices. As pointed out by Day (2010), committed relationships are the most sustainable advantage because of their inherent barriers to competition. The growth of mass customization and personalized service is leading to an era in which relationship management with customers is becoming crucial for corporate survival. Good relationships with supply chain members, including customers, are needed for successful implementation of supply chain managements programs. Close customer relationship allows an organization to differentiate its product from competitors,

sustain customer loyalty, and dramatically extend the value it provides to its customers (Stuart, 2014).

Romano (2011) suggested that level of information sharing is a key component in ensuring effective supply management. Romano (2011) noted that information sharing has two aspects: quantity and quality. Both aspects are important for best practices of supply chain management and have been treated as independent constructs in the past studies on supply chain management. Level (quantity aspect) of information sharing refers to the extent to which critical and proprietary information is communicated to one's supply chain partner. Shared information can vary from strategic to tactical in nature and from information about logistics activities to general market and customer information (Mentzer & Konrad, 1991).

Many researchers have suggested that the key to the seamless supply chain is making available undistorted and up-to-date marketing data at every node within the supply chain (Child House & Towill, 2003). By taking the data available and sharing it with other parties within the supply chain, information can be used as a source of competitive advantage. Sharing of information is one of five building blocks that characterize a solid supply chain relationship. According to Child House & Towill (2003), supply chain partners who exchange information regularly are able to work as a single entity. Together, they can understand the needs of the end customer better and hence can respond to market change quicker. Moreover, to Child House & Towill (2003) considered the effective use of relevant and timely information by all functional elements within the supply chain as a key competitive and distinguishing factor. The empirical findings of Child and Towill (2003) revealed that simplified

material flow, including streamlining and making highly visible all information flow throughout the chain, is the key to an integrated and effective supply chain.

Another measure to ensure effective supply chain in companies is quality of information sharing (Moberg, 2002). This includes such aspects as the accuracy, timeliness, adequacy, and credibility of information exchanged (Moberg, 2002). While information sharing is important, the significance of its impact on supply chain management depends on what information is shared, when and how it is shared, and with whom (Holmberg, 2000). Literature is replete with examples of the dysfunctional effects of inaccurate/delayed information, as information moves along the supply chain. Divergent interests and opportunistic behavior of supply chain partners, and informational asymmetries across supply chain affect the quality of information (Feldmann, 2003). It has been suggested that companies will deliberately distort information that can potentially reach not only their competitors, but also their own suppliers and customers. It appears that there is a built-in reluctance within companies to give away more than minimal information since information disclosure is perceived as a loss of power. Given these predispositions, ensuring the quality of the shared information becomes a critical aspect of effective supply chain management (Feldmann, 2003). Organizations need to view their information as a strategic asset and ensure that it flows with minimum delay and distortion.

Lean practices are another measure companies can put in place to ensure effective supply chain management. According to Lean Enterprise Institute (2009), lean practices involve process of removing all of the wasted time and resources in the production process. Today's demand driven supply chains require lean procurement methods whose goals are: to eliminate waste in all procurement cycles, prevent

shortages, reduce inventory investment, reduce procurement lead time and cost, increase inventory turnover and ensure customers satisfaction. These methods ensure greater efficiency and standardization of supply chain procedures.

Another measure is adopting postponement strategy. Postponement is defined as the practice of moving forward one or more operations or activities (making, sourcing and delivering) to much later point in the supply chain (Waller, 2006). Two primary considerations in developing a postponement strategy are: determining how many steps to postpone, and determining which steps to postpone. Postponement allows companies to be flexible in developing different versions of the product in order to meet changing customer needs, and to differentiate a product or to modify a demand function (Waller, 2006). Keeping materials undifferentiated for as long as possible will increase an organization's flexibility in responding to changes in customer demand. In addition, a company can reduce supply chain cost by keeping undifferentiated inventories. Postponement needs to match the type of products, market demands of a company, and structure or constraints within the manufacturing and logistics system. In general, the adoption of postponement strategy maybe appropriate in the following conditions: innovative products ; products with high monetary density , high specialization and wide range; markets characterized by long delivery time, low delivery frequency and high demand uncertainty; manufacturing or logistic systems with small economies of scale and no need for special knowledge (Waller, 2006).

Performance Measures for Oil Marketing Companies in Petroleum Industry

Performance measures are used to design proposed systems, by determining the values of the decision variables that yield the most desirable level(s) of performance

(Osoro, 2016). A company in the petroleum industry, therefore, needs to have performance measurements to be able to evaluate the efficiency of the supply chain systems. Taylor (2014) stated that a company cannot manage if it cannot measure.

Available literature identifies a number of performance measures as important in the evaluation of supply chain effectiveness and efficiency (Schrettle et al., 2013). The performance prism framework suggests that a performance measurement systems should be organized around five distinct but linked perspectives of performance (Tseng & Chiu, 2013): a) stakeholder satisfaction – identifying stakeholders and what they want and need; b) strategies – strategies required to ensure the wants and needs of the identified stakeholders are met; c) processes - the processes put in place in order to allow the strategies to be delivered; d) capabilities – the combination of people, practices, technology and infrastructure that together enable execution of the organization's business processes, both now and in the future, and the capabilities required to operate the processes; and stakeholder contributions - what do a company want and need from stakeholders to maintain and develop the capabilities. The performance prism has a much more comprehensive view of different stakeholders (investors, customers, employees, regulators and suppliers) than other frameworks (Cheng, 2014).

On the other hand, Barrow (2013) observed that oil marketing companies have to achieve both cost leadership and service leadership to have an efficient supply chain. If a company only measure internal performance measurements as for example order handling time and yield in production, such measurements cannot be used for evaluating the efficiency in a company. Shatina (2016) also claimed that most of the supply related performance measurements have an internal focus and do not

measure how the company drives profitability. If this still is valid there is an indication that there is a gap of measuring efficiency. Agami,Saleh, and Rasmy (2012) observed that a previous empirical finding shows that managing performance of supply chain systems measures have lacked precision and consistency. Alquist, Kilian and Vigfusson (2013) established that many researchers have only focused on financial performance measures at the expenses of managing performance of supply chain systems and their proper forecasting of accuracy. It is inadequate to merely analyze a company's performance by financial capability, especially under today's changing volatile supply chain systems (Hannum, 2016).

Performance in companies takes many forms depending on whom and what the measurement is meant for. Different stakeholders require different performance indicators to enable them make informed decisions (Manyuru, 2005). According to Richard et al. (2009) organizational performance encompasses three specific areas of firm outcomes: a) financial performance ; b) product market performance and c) shareholder return (Effective non-profits are mission driven, adaptable, customerfocused, entrepreneurial, outcomes oriented and sustainable. Thompson et al. (2007) noted that using financial measures alone overlooks the fact that what enables a company to achieve or deliver better financial results from its operations is the achievement of strategic objectives that improve its competitiveness and market strength. Nonfinancial measures include innovativeness and market standing (Thompson et al, 2007). Performance is therefore measured by both financial and nonfinancial measures. Morton (2013) listed various methods to measure the overall organizational performance which are; accounting measures (profitability measures, growth measures, leverage, liquidity and cash flow measures), operational performa

nce (market share, changes in intangible assets such as patents or human resources, customer satisfaction and stakeholder performance market based measures (return on shareholder performance), market based measures (return on shareholder, market value added, holding period returns), survival measures (takes time horizons of five years and less) and economic value measures (residual income, economics value added and cash flow return on investment). This study focused on non-financial aspects of measuring performance of companies in the petroleum industry in Kenya

Empirical Literature Review

Previous empirical studies have been conducted on supply chain management and petroleum industry. For instance, Hussain et al. (2006) conducted a study concentrating on the management of the supply chain cycle in the petroleum industry with particular focus on challenges and opportunities. The major goal of Hussain et al.'s study was to establish the major challenges and opportunities in the supply chain channels in the industry of petroleum. Further, the study focused on the practices of swap practices, which have been adopted and implemented by global giant companies in the petroleum industry, such as Beyond Petroleum (BP), Badische Anilin-und Soda-Fabrik (BASF), Honeywell, Nova, and much more.

In a study conducted by Zhao and Chen (2014) in China, the authors established that China relies on imported crude oil which is not enough to cater for the increased demand in the industrial and developed economy. For this reason, petroleum prices are volatile, making businesses to suffer frequent oil prices changes. Government

interference in the oil marketing sector hinders free markets, making the sector uncompetitive.

In Ghana, Amponsah and Opei (2013) carried a study that purposed to evaluate key supply chain challenges in the downstream petroleum sector. In their findings, the authors realized that, failure of the management to pay beneath retrievals, insufficient infrastructure and incapacity of the Tema Oil Refinery to produce petroleum products that meet the expectations of the marketers and consumers were among the challenges faced. Amponsah and Opei, (2014) revealed that in as much as petroleum consumption in Ghana increased the supply of petroleum product was always low.

Osoro (2016) did a study on the challenges affecting performance of supply chain systems in the petroleum industry in Kenya. The study examined several parameters that affect workers' supply chain performance in the petroleum industry in Kenya resulting to often oil shortages. The author noted that this has been occasioned by globalization which has intensified competition and increased the mobility of high skilled personnel yet companies in petroleum industry depend on their staff for success and sustainability whether skilled or not. The study was conducted using a survey design and the target population of the study was the 73 registered companies in petroleum industry in Kenya. The study revealed that level of skill for staff negatively affected the performance of supply chain. This study therefore brought to the fore, the role of skills and its effect on performance. The findings of Osoro's (2016) study also indicated that crude oil price affect performance. In the presences of level of skills of staff, crude oil price, information communication and technology and tendering systems did not affect performance. These findings also indicated that in the presence of level of skill of staff, information communication and technology,

crude oil price and tendering systems did not affect performance of the supply chain systems. Further, the study established that majority of the respondents felt that the cause of fuel shortages was unpredicted price increase in the petroleum industry. The findings showed that personal characteristics such as age and education level did not have a moderating effect on the relationship between independent variables and dependents variable. Finally, this study concluded that there is need to emphasize the effect of performance on supply chain systems by doing proper forecasting from the up streams to the down streams towards achieving a competitive edge in the business markets such as the petroleum industry.

A study was conducted by Nginga (2013) on determinants of multinational firms' investment decisions in the downstream petroleum industry in Kenya. Nginga's study used cross-sectional descriptive research design targeted population included five multinational companies in petroleum industry in Kenya, and used questionnaires to collect raw data. The study found out that the most important determinants of multinational oil firms' investment decisions is the investor security and good infrastructure mainly in the transportation and telecommunication sectors. Government regulations and investor security were indicated as the main difficulties and concerns facing the foreign investors in the oil and mining sector in Kenya. Further recommendation by Ngugi's was that more research should be conducted to be done on the same in the areas such as upstream and midstream oil sectors in the country. Nginga's concentrated on the determinants of multinational firms' investment decisions in the downstream sector of the petroleum industry in Kenya and not the downstream supply chain challenges that this study focuses on.

Mutuma (2009) conducted a study on Kenya's petroleum exploration and production law. Focus was on challenges for investors, the government and local communities of Kenya. The study analysed the legal, policy and institutional challenges in the regulation of oil exploration and production in Kenya. In this regard, it analysed the existing legal, policy and institutional framework for regulating oil exploration and production in Kenya to determine whether it is adequate and effective to protect the social, economic and environmental interests of the local community, the investor and the government, and to make recommendations as necessary, including proposals for legal reform in the sector. The study found that although the Government has taken major steps to create a framework that guarantees the security of investors in oil exploration and production sector, the resultant framework is far from adequate and efficient.

Mutuma's (2009) study further revealed that the current legislation do not adequately take care of the welfares of the people in the background of production/examination of oil. In the first place, the operative law was enacted before the constitutional framework establishing public participation as a key pillar of natural resources development was promulgated. Secondly, there are no clear safeguards in the current legal framework to ensure that the scanty public participation mechanisms required are observed as per the law. Thirdly, the institutional framework in place is not adequately devolved to guarantee local and regional community participation in the licensing, auditing and review process of oil exploration and production projects in the country. Mutuma's study majorly focused on the challenges that are facing the local communities, the government at large, and even the investors in the oil industry and not the downstream supply chain challenges that this study focuses on.

Mwale (2014) conducted a study on supply chain management practices and organizational performance of large manufacturing firms in Nairobi. The research design involved a cross sectional survey of 46 large manufacturing companies in Nairobi. Data was collected using a questionnaire that was administered through “drop and pick” method. From Mwale’s (2014) study, it is clear that there is a significant relationship between supply chain management practices and organization performance as explained by the seven independent variables, namely strategic supplier partnership, customer relationship, level of information sharing, quality of information, extent of outsourcing, lean practices and postponement. Mwale’s (2014) study recommended further research on other firms that are not located in Nairobi and are not in the manufacturing industry.

Conceptual Framework

The study’s conceptual framework is derived from the literature that has been reviewed. The relationship between the study’s variables, that is; independent, intervening and dependent variables, is shown in visual diagrammatic presentation shown in Figure 2.1.

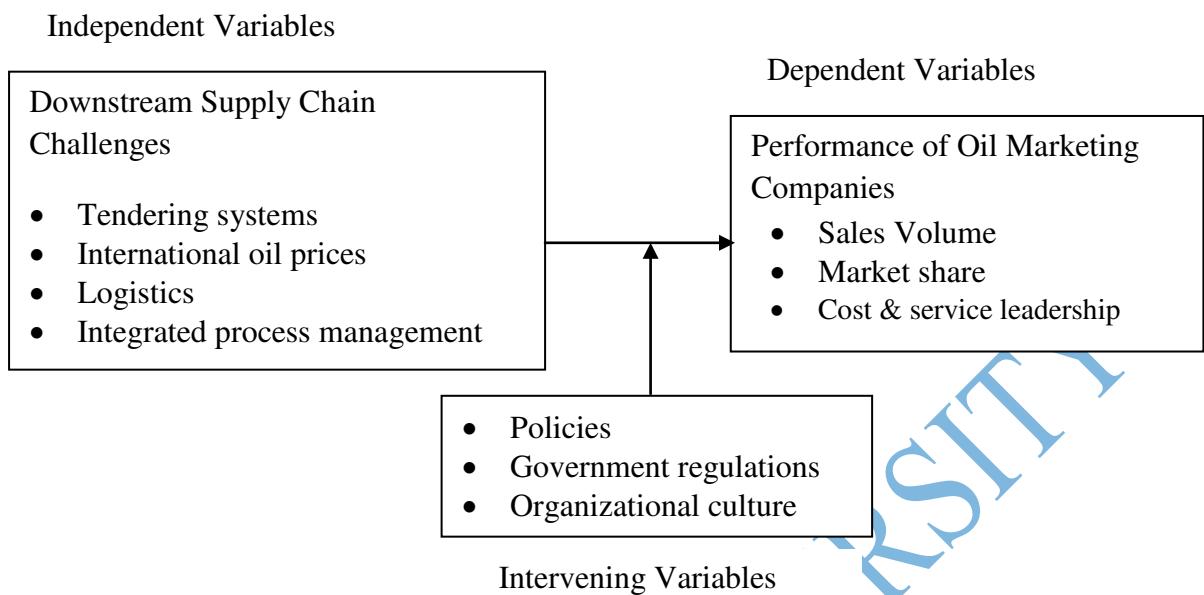


Figure 2.1: Conceptual Framework

Source: Author (2019)

The connection between the independent, intervening and dependent variables of this study is shown in Figure 2.1. The Figure shows that there are already existing downstream supply chain challenges in the petroleum industry which include: tendering systems, international oil prices, logistics, and integrated process management challenges. These challenges are the independent variables since they are affecting performance oil marketing companies in the petroleum industry. Thus, performance of oil marketing companies becomes the dependent variable. However, there are factors that add to the existence of downstream supply chain challenges in the petroleum industry which in turn influence the performance of oil marketing firms. These factors are shown in Figure 2.1 as the intervening variables. They include government policies on oil trade, government regulations on oil trade and organizational culture of oil marketing companies in Kenya.

Summary

The chapter has discussed the literature review that is relevant to this study. Among the literature the researcher looked include the theoretical framework whereby the researcher discussed the tendering theory and the performance theory as the most appropriate theories for this study. The researcher also looked at the general literature with particular focus on the supply chain challenges in the petroleum industry, the effect of the challenges on performance of companies in petroleum industry, measures to curb the challenges, and the performance measures of companies in petroleum industry with regards to supply chain systems. The chapter also provided the empirical literature and the conceptual framework for this study. In the next chapter, the research methodology for this study was provided.

CHAPTER THREE

RESEARCH METHODOLOGY

Introduction

Research methodology lays out the process of collecting data including the actual design of the research and all the stages that are adopted to solve the problem that the research sought to address (Creswell, 2009). Therefore, this chapter presents the process the study used to solve the research problem. It captures the aspects of research methodology, including; research design e type of research design this study adopted, the population from which the data was generalized, the actual sample, the sampling techniques, and the corresponding data collection methods. Additionally, it discusses how pretesting was conducted, how validity and reliability was tested, and how collected data was analyzed. The chapter ends with the study's research ethical considerations.

Research Design

It refers to the process of collecting data for purposes of answering questions regarding the present status of subjects in a study (Gay, 2010). Therefore, a study's research design is simply the plan put in place to incorporate various constituents of the research process in a cohesive and coherent manner.

The study used descriptive research design, which according to Cooper and Schindler (2011) aims at providing information relating to the current status of the phenomena, as it exists. For this study, the phenomenon that the researcher looks at is the effect of downstream supply chain challenges on performance of companies in the petroleum industry. Descriptive research design is not only restricted to fact-findings, but may

also broaden to formulation of solutions to significant problems (Chandran, 2004). In this study, the researcher sought to establish solutions or measures that can be put in place to curb the downstream supply chain challenges affecting performance of companies in the petroleum industry, thus the justification on the choice of descriptive research design.

Through the use of descriptive research design, the researcher was able to obtain information on the effect of downstream chain challenges on performance of companies in petroleum industry as it exists on the ground. This is based on the argument that descriptive research design looks forward to obtain an exact information about the current situation of an occurrence (Cooper & Schindler, 2011). Moreover, the design guides the researcher in establishing the relationships between the study's variables (Trochim, 2007). Additionally, descriptive research design quantifies communal phenomena and specific subjects, circumstances and problems prevalent in an organisation (Mugenda, 2008).

Population

According to Mugenda (2008), population in research refers to all people or objects/events with the study's observable features. The study population for this study included all employees and Board of Management of all registered oil marketing companies operating in Nairobi County, Kenya. According to records of ERC (2018), there were 83 registered oil marketing companies in Nairobi County (see appendix A). Therefore, all employees, managers, and directors of the 83 registered oil marketing companies in Nairobi formed the population of this study.

Target Population

Refers to the particular people/objects/events selected by the researcher to represent the larger study population in generalizing the study's findings (Mugenda, 2008; Creswell, 2009). Following this definition, it is appropriate to conclude that target population of interest is homogeneous. For this study, the targeted population included the staffs and the Boards of Management of carefully chosen registered oil marketing companies in Nairobi. A sample of 10% of the whole population is satisfactory representation in a descriptive study (Mugenda & Mugenda, 2003). Therefore, the researcher applied multi-stage sampling technique to select eight (8) registered oil marketing companies (10% of the total 83 companies) to represent the entire population (83 registered oil marketing companies). The selected (8) registered oil marketing companies and their total number of employees are shown in Table 3.1.

Table 3.1: Target Population

Selected Companies	No. of Employees (Target Population)
Vivo Ltd	250
Asharami Ltd	6
Oryx Ltd	38
Blue Sky Ltd	10
Total Ltd	270
Nock Ltd	150
Gulf Ltd	100
Link Oil Ltd	6
Total	830

Source: Author (2019)

Sample Size

Sample size is very important in making inferences about a population especially in an empirical study (Saunders, Lewis, & Thornhill, 2009). It is simply a small section that represents the entire population. The number of respondents accepted in a study as the sample size depends on the type of research being carried out; correlational, descriptive or experimental (Sekaran & Bougie, 2010).

In a descriptive research such as the current study, 10% of the target population is adequate for a sample size (Mugenda & Mugenda, 2003). However, if the target population is not more than 500, then 20 to 30% may be required (Gay & Diehl, 1992; Neuman, 1997). Since the target population for this study was 830, which is more than 500, the researcher used 10% of the target population due to budgetary considerations including time and financial limitations. It therefore implies that the sample size of this study was 83 respondents as shown in Table 3.2.

The sample size (83) was selected from the eight (8) randomly selected oil marketing companies in Nairobi using proportionate stratified random sampling formula presented by Mugenda and Mugenda (2003) as shown below.

$$nh = (Nh/N) * n$$

Whereby;

nh is the sample size for each stratum (Company),

Nh is the target population size for each stratum (Company) h ,

N is the total target population size of all the 8 selected companies, and

n is the total sample size.

For instance, for the Vivo Ltd, Nh is 250; N is 830; and n is 83. Therefore, the sample size (nh) for Vivo Ltd will be $(250/830) * 83 = 25$ respondents. Therefore, the number of respondents in each company was as shown in Table 3.2.

Table 3.2: Sample Size

Selected Companies	Target Population	Sample Size
Vivo Ltd	250	25
Asharami Ltd	6	1
Oryx Ltd	38	3
Blue Sky Ltd	10	1
Total Ltd	270	27
Nock Ltd	150	15
Gulf Ltd	100	10
Link Oil Ltd	6	1
Total	830	83

Source: Author (2019)

In addition to the 83 sampled employees (respondents) shown in Table, 3.2, eight (8) key informants (10% of the sample size) was purposively selected for in-depth interviews. The eight were either managers or directors of the eight selected oil marketing companies who directly deal with supply chain and management their respective companies.

Sampling Techniques

Sampling is defined by Gay (2010) as the statistical process used in research to select a suitable representative individuals of the larger population of the study. Mugenda (2008) also noted that sampling technique is a criterion that is adopted by the researcher to guide in the selection of a sample is referred. Therefore, a sampling technique defines the rules that specify how the sample size will be drawn from the target population.

In this study, multi-stage sampling technique, specifically a two-stage sampling, was applied: Primary and secondary stage. In the primary stage, stratified sampling technique was applied whereby a list of all oil marketing companies in Nairobi will be made to form a stratum (see appendix A). From the stratum, 10% (8) of the total number (83) of oil marketing companies in Nairobi was randomly selected to form eight (8) primary units. The researcher decided to randomly select 10% (8) of the companies because Mugenda and Mugenda (2003) argued that 10% of the target population is an adequate sample size in a descriptive study.

The total number of employees in the eight (8) randomly selected oil marketing companies was established and a sample size calculated. In the secondary stage of the multistage sampling, the study applied proportionate simple random sampling

technique to pick the desired sample from across the eight (8) primary units (eight randomly selected oil marketing companies). Simple random sampling was therefore used to select the 83 respondents of this study. This means that all the employees of the eight (8) selected oil marketing companies in Nairobi had an equal chance of being selected to participate in this study. This ensured that the selected respondents were representative of the entire population of the oil marketing companies in the petroleum industry in Nairobi.

The study also applied purposive sampling in selecting of key informants (one director/manager from each of the eight selected oil marketing companies) of this study for in-depth interviews. Use of purposive sampling in selecting key informants was suitable because it saved time due to the small number of key informants, and also the researcher selected key informants based on their relevance to the purpose of the study. In this study therefore, the researcher used purposive sampling in selecting a director/manager from each of the eight (8) randomly selected oil companies who are directly involved in the supply chain processes in oil marketing companies in Nairobi.

Data Collection Instruments

Research tools are testing devices for gaging a given phenomenon, and are tools used in data collection of a study (Mugenda, 2008). In this study, the researcher used questionnaires and key informant interview guides.

Questionnaires

Questionnaires were used to collect primary quantitative data from employees of the selected oil marketing companies in Nairobi. Kothari (2004) noted that the use of a questionnaire in collecting primary data is by large extent the most broadly used in

most research studies. The questionnaire for this study was structured and planned in a way that most of the questions were quantitative (closed-ended) while a few were qualitative (open-ended). Quantitative (closed-ended) questions provided precise data on types of downstream supply chain challenges affecting companies in petroleum industry in Kenya, effect of the challenges on performance oil marketing companies, and measures that can be put in place to curb the downstream supply chain challenges. Open-ended (qualitative) questions was used to collect respondents' views, opinions and thoughts on the various downstream supply chain challenges in petroleum industry, their effect on performance companies in petroleum industry, and measures that can be put in place to curb the downstream supply chain challenges affecting performance of companies in petroleum industry. The questionnaire was structured in sections whereby each section addressed a specific objective of this study.

In-depth Key Informant interview Guides

Key informant interview guides were used to obtain insight qualitative data from the selected key informants comprising of the mangers/directors of selected oil marketing companies in Nairobi. A total of eight (8) in-depth interviews were carried out with the managers /directors with the managers or directors.

Types of Data

Both primary and secondary was used in this study. Secondary data was obtained through literature review of books, paper articles, annual reports and unpublished previous research projects on supply chain in petroleum industry. Primary data was obtained from the field through data collection exercise using questionnaires and in-depth interview guides for key informants. The primary data was both quantitative and

qualitative in nature. The quantitative data was collected using closed-ended questions in the questionnaire while qualitative data was collected using open-ended questions in the questionnaire.

Data Collection Procedures

This study followed a systematic procedure in gathering and measuring information required for achieving the objectives of this study as explained here in after. Prior to data collection, the researcher recruited and trained two research assistants (RAs) who assisted in administering the questionnaires with the respondents. Then the researcher made a prior visit to the oil marketing companies in Nairobi County to explain to the management the purpose of the study and her intention to conduct research with their staff, suppliers, distributors, and marketing agents. The prior visit enabled the research to also seek permission to collect data related to the study in organizations thus ensured that the research was legally conducted.

The study employed “drop and pick” method for questionnaire administration. However, before leaving the questionnaires with the respondents to fill and be picked later, the research assistants requested the respondents to go through the questions in the questionnaire and seek clarification on any question that they do not understand. If any respondent required clarification, the research assistants explained and clarified to the respondent’s satisfaction. The research assistants also ensured that participants had enough time to answer the questions in the questionnaire before collecting the filled questionnaires as agreed with the respondents.

Prior to conducting in-depth interviews with the managers and directors, the researcher booked appointments with the managers/directors of the companies. On the

agreed day and time, the researcher interviewed the key informants as the research assistants helped in taking notes of the responses provided.

Pretesting

According to Gravetter and Forzano (2008), pre-testing is a critical inspection of research tools that will help determine if the research will function properly as a valid and reliable social science tool. Pretesting gives the researcher a good chance to review scripts, look for mechanism actions and scan the atmosphere for factors that confound the results. The pre-test sample size is estimated at between 1% to 10% of the desired sample size as noted by Mugenda (2008). Based on this information, the researcher conducted pre-testing with 8 respondents (10% of the desired study sample size). The respondents of pretesting were drawn from Galana Oil Kenya Ltd in Nairobi which is not among the 8 selected oil marketing companies that was involved in actual data gathering.

Validity and Reliability of the Research Instruments

Validity is the degree to which an instrument measures what it purports to measure. It estimates how accurately the data in the study represents a given variable or construct in the study (Mugenda & Mugenda, 2003). This study employed content validity whereby a questionnaire (research instrument for this study) was established through careful definition of the research based on reviewed literature. In addition, the research sought opinion from experts in the field supply chain. The researcher's supervisors had a copy of the questionnaire and in-depth interview guide to review and ensure that the questions address the objectives and research questions of the study. The suggestions made facilitated the necessary revision and modification of the questionnaire thereby enhancing its validity.

Reliability is the tendency towards consistency (Shenghverzy, 2003). Reliability is increased by including many similar items on a measure, by testing a diverse sample of individuals, and by using uniform testing procedures. It is commonly used in relation to the question of whether the measures that are devised for concepts in business are consistent. In this study, Cronbach's alpha coefficients (α) was used to determine the average internal consistent (reliability) of items that were on multiple likert scale. The higher the (α) coefficient the more reliable is the construct. As a rule of the thumb, the acceptable range of Cronbach alpha coefficient is between 0.70 and 0.90 or higher depending on the type of research. A Cronbach alpha coefficient of 0.70 or more is acceptable for exploratory or descriptive research while 0.8 and 0.9 are acceptable for basic research and applied sciences respectively. Therefore, the researcher conducted Cronbach alpha test using questionnaires that were obtained from pretesting exercise with 7 respondents selected from an oil marketing company in Nairobi that didn't participate in the actual study. The findings were as presented in Table 3.3.

Table 3.3: Cronbach's Alpha Coefficients for Multiple Likert Scale Items

Factor	Cronbach's Alpha	No. of Items	Verdict
Downstream supply challenges	.716	4	Acceptable
Effect of supply chain challenges	.850		Good
Performance of oil marketing companies	.928	3	Excellent

Table 3.3 shows that Cronbach's alpha coefficients for the variables with multiple likert scale were 0.716, 0.850, and 0.928 for downstream supply challenges, effect of the supply chain challenges, and performance of oil marketing companies respectively. Since all the Cronbach's alpha coefficients were more than 0.7, it implies

that the level of internal consistency for all the items that were on multiple likert scale is acceptable. Therefore, the statements that were used to measure the downstream supply challenges, effect of the supply chain challenges, and performance of oil marketing companies were reliable and could yield the same results whenever they are used. This means that the questionnaire that was used in this study was reliable thus the findings were accurate, valid and relevant to this study according to the purpose of this study.

Data Analysis Plan

Data analysis is the process of bringing order, structure and meaning to the mass of information collected. It involves examining what has been collected and making deductions and inferences (Kombo & Tromp, 2006). Quantitative data that was collected through closed-ended questions in the questionnaires was first coded. This involved giving all statements numeric codes based on their meaning for ease data capturing. This was followed by data entry and statistical analysis using Statistical Packages for Social Sciences (SPSS) version 23.0, computer software that makes it easy to analyze the distribution and frequency of data (Robson, 2002). Qualitative data that was generated through open-ended questions in the questionnaires was analyzed thematically whereby data obtained in each open-ended question was first categorized/grouped into themes based on the objectives of the study and each theme assigned a subtitle. The subtitles were coded, entered into SPSS version 23.0 and analyzed statistically like quantitative data. The findings of both quantitative and qualitative data were presented in form of frequency tables, charts and figures.

Ethical Considerations

Prior to data collection exercise, the researcher was submitted the final research proposal to the Department of Development Studies for approval and then to the University's Ethics Review Board (ERB) to check the researcher's adherence to general research ethics. After review, the ERB was issued an ethics clearance report which the researcher was used to seek a research permit from the National Council for Science, Technology and Innovations (NACOSTI) of Kenya, and Oil Marketing Companies.

The researcher sought the consent of the respondents and assured them of anonymity of their responses and confidentiality of the information that was provided. Their names or contacts was not included in the questionnaire. The researcher also assured respondents that the information they provided was used for academic purposes only.

Additionally, the researcher assured the respondents that the company management's permission had been sought to carry out the research. To ensure the company's information is treated with confidentiality, the researcher gave an undertaking not to divulge any information and also obtained a letter from Daystar University seeking permission to carry out the research study.

Last but not least, the researcher make sure that the questions in questionnaire were in a simple language for easy understanding and do not mete out hurt of any kind, be it bodily, mental abuse or even lawful threat to the participants.

Summary

This chapter reviewed the methodology of the study in terms of the research design, target population, sample size and sampling procedures, tools and data collection

methods, data collection procedures and methods of data analysis. It briefly entails the research design, which was used; the picking of a number of respondents that gave information that was best captured the study's interest and also showed methods of arriving at the sample for representativeness. The next chapter provides the presentation, analysis and interpretation of the primary data obtained from the field.

DAYSTAR UNIVERSITY

CHAPTER FOUR

DATA PRESENTATION, ANALYSIS, AND INTERPRETATION

Introduction

This chapter presents the study's findings that were obtained from the data collection exercise. It captures presentation of primary data which was analyzed through the SPSS software, the analysis of the presented data, and the interpretation of the findings. Both descriptive (i.e. frequency and percentages) and inferential (i.e. correlation) analyses were conducted in order to make available a general description of the research findings and the connection among the independent and dependent variables respectively. Presentation of the findings is in form of statistical distribution tables, charts, graphs, and narratives or direct quotes for information from the key informants. The explanation of the key findings is based on the research objectives.

Analysis and Interpretation

Response Rate

This study's targeted sample size was 83 employees of selected oil marketing companies in Nairobi County and eight key informants comprising of managers/directors of the eight selected oil marketing companies in Nairobi County. Therefore, 83 questionnaires were distributed to the employees of the selected oil marketing companies and eight in-depth interviews were targeted with the eight key informants. Upon completion of the data collection exercise within the scheduled study period, only 70 questionnaires were duly filled and returned to the researcher. For the in-depth interviews, the researcher managed to conduct only five out of the possible eight interviews with managers/directors of the selected oil marketing

companies. It gives 90.4% response rate for questionnaires, 62.5% for in-depth interviews, and 82.4% overall as shown in Table 4.1.

Table 4.1: Response Rate

Respondents category	Targeted Sample	Actual Sample Size	Response Rate
Employees of 8 selected oil marketing companies (Primary respondents)	83	70	90.4%
Managers/Directors of 8 selected oil marketing companies (Key informants)	8	5	62.5%
Total	91	75	82.4%

An overall response rate of 82.4% in a descriptive study is excellent to draw conclusions and make recommendations. This is according to Mugenda and Mugenda (2003), who asserted that a response rate of 50% is fair, 60% is good, and 70% and above is excellent for a descriptive study.

The section starts by providing a description of the demographic information of the respondents that were of interest for this study. Then study findings of each of the research objectives are provided. They include; challenges facing downstream supply chain among oil marketing companies in Nairobi County, ways of coping with downstream supply chain challenges, effects of downstream supply chain challenges on performance of oil marketing companies, and measures that can be put by oil marketing companies in place to curb downstream supply chain challenges.

Information from the in-depth interviews is presented in form of narratives or direct quotes from the respondents. For uniformity and consistency purposes, all key informants are referred to as “Manager” with a code to differentiate them, that is, Manager 1, Manager 2, Manager 3, Manager 4, and Manager 5.

Demographic Information of the Respondents

Demographic information of the respondents was important for this study since it gives a general understanding of their personal background information that could influence the manner in which they gave responses. The study was interested in the gender, age bracket, education level, position in the company, and period worked in the current position.

Respondents' gender

The study sought to know the gender of the respondents. The findings were as presented in Figure 4.1.

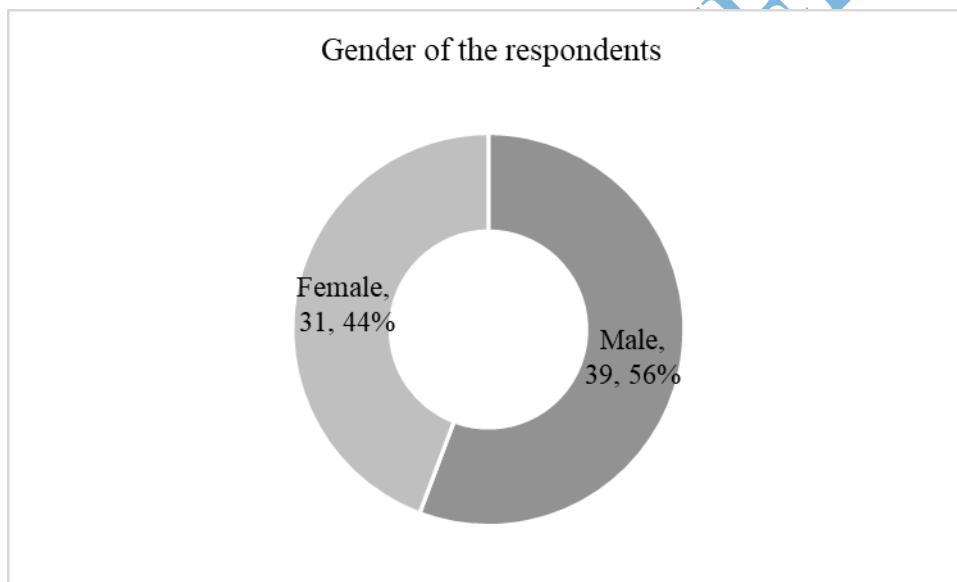


Figure 4.1: Gender of the Respondents

As presented in Figure 4.2, male respondents were more at 39(56%) compared to their female counterparts at 31(44%). The findings show that there are more male staffs employed in oil marketing companies in Nairobi County compared to female employees. Further, the findings indicate that this study was not gender bias; both genders gave their views and opinions about downstream supply chain challenges and their influence on performance of oil marketing companies in Nairobi County.

Respondents' age bracket

The study sought to know the age bracket of the respondents and the findings are displayed in Figure 4.2.

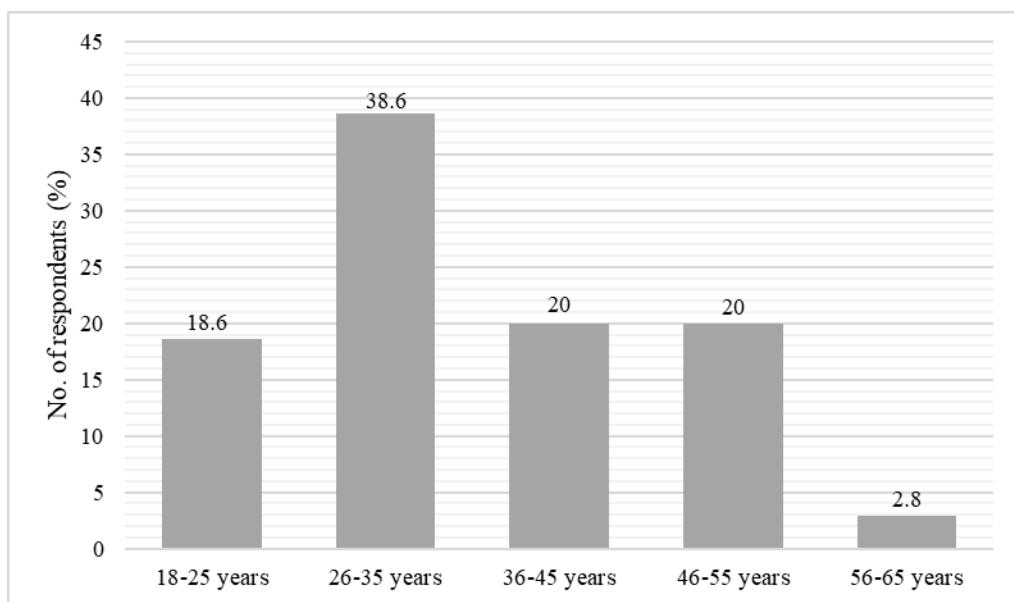


Figure 4.2: Age Bracket of Respondents

The findings in Figure 4.2 show that 27(38.6%) of the respondents were aged between 26-35 years, 14(20%) were between 36-45 years, another 14(20%) were between 46 - 55 years each, 13(18%) were between 18-25 years, while 2(2.8%) were between 56-65 years. The findings imply that the study was not age biased since the respondents were selected from a wide range of age brackets. The youth (18-35 years old) were slightly more at 40(57.2%) compared to those who were above 35 years old 30(42.8%), thus, employment in oil marketing sector is not diverse in terms of age.

Respondents' level of education

The purpose of this inquiry was to identify the level of formal education that the respondent had achieved. This was useful to determine whether the respondents had the requisite aptitude to understand the questions asked in the questionnaire. Additionally, level of education of the respondents enabled the researcher to ascertain

whether the respondents were academically competent to provide reliable information for this study. Study findings were as shown Table 4.2.

Table 4.2: Education Level

Education level	Frequency	Percentage (%)
Primary	1	1.4
Secondary	15	21.4
Certificate	10	14.3
Diploma	20	28.6
Bachelors	15	21.4
Master'	4	5.7
Professional course	5	7.2
Total	70	100

The findings in Table 4.2 reveal that respondents of this study had different levels of academic qualifications. A higher number at 20(28.6%) had attained diploma level education, followed by 15(21.4%) who had attained undergraduate level education, another 15(21.4%) had attained secondary level education, while 10(14.3%) had achieved education up to certificate level. A few respondents had attained Masters' level education and professional courses at 4(5.7%) and 5(7.2%) respectively. Only one respondent indicated that he/she had attained only primary level education. These findings are a clear indication that there was diversity in terms of education level among the respondents of this study. With 54(77.2%) of the respondents indicating that they had attained at least certificate level education, it is probable to conclude that majority of the respondents who took part in this study were generally knowledgeable, thus, could read and interpret research questions, and respond appropriately: This makes the study findings valid and reliable.

Respondents 'position at their companies

The study was also interested in knowing the position of the respondents in their respective oil marketing companies. The findings are presented in the Table 4.3.

Table 4.3: Respondents 'Position at their Companies'

Position	Frequency	Percentage (%)
Service Station Attendant	18	25.7
Supervisor	7	10.0
Sales and Marketing Officer	7	10.0
Store manager	6	8.6
Accountant	5	7.1
Security officer/manager	5	7.1
Procurement Officer	3	4.3
Stock-controller	2	2.9
General manager	1	1.4
IT Officer	1	1.4
No response	15	21.5
Total	70	100

From the study finding in Table 4.3, a bigger number of the respondents at 18(25.7%) were service station attendants, followed by supervisor and sales and marketing officers at 7(10%) each respectively. Other positions that were held by the respondents include; store manager at 6(8.6%), accountant at 5(7.1%), and security officer/manger at 5(7.1%). There were also respondents who indicated that they were procurement officers, stock-controller, general manager, and information technology (IT) manager as shown in the table above in a descending order. These findings show that this study obtained information from respondents with different areas of specialization, thus, a wide range of understandings on the downstream supply chain challenges and their effects on company performance.

Duration in the current position

The study sought to know the number of years that the respondents had been working in their respective positions with findings as shown in Table 4.3.

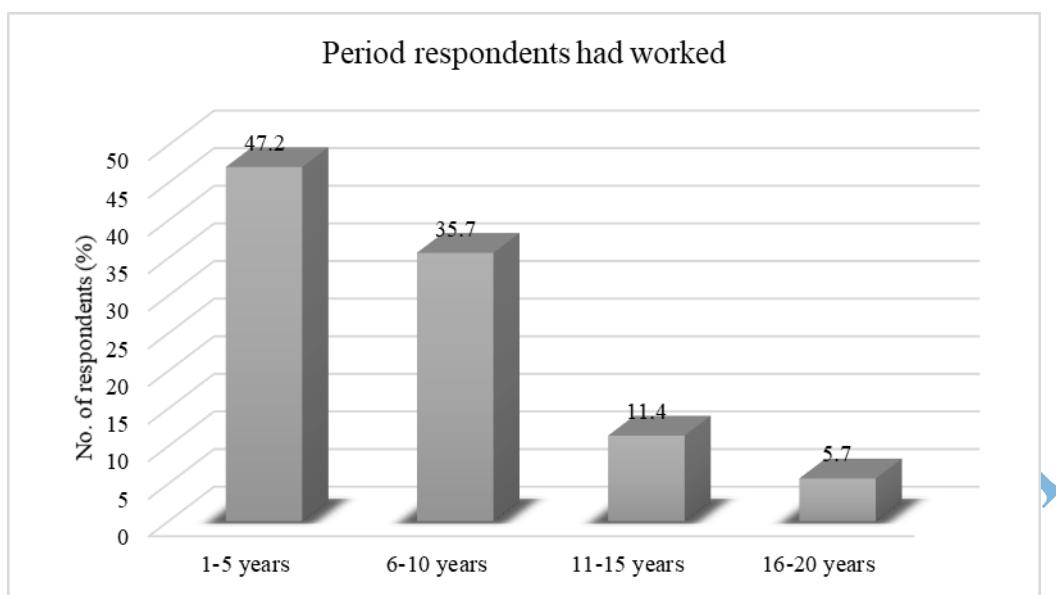


Figure 4.3: Period respondents had worked

From the findings in Figure 4.3, most of the respondents at 33(47.2%) indicated that they had been working in their respective positions for a period of between 1-5 years, 25(35.7%) for between 6-10 years, 8(11.4%) for 11-15 years, while 4(5.7%) had worked in their current position for 16-20 years. These findings demonstrate that more than half of the respondents at 37(52.8%) had worked in their current position in their respective oil marketing companies for more than 5 years, enough period for them to understand on downstream supply chain challenges, ways to cope with the challenges, and their effect on performance of oil marketing companies. This suggests that the findings of this study were acquired from well-informed respondents, thus, reliable and relevant.

Challenges Facing Downstream Supply Chain among Oil Marketing Companies

The first objective of this study was to establish the downstream supply chain challenges facing oil marketing companies in Nairobi County. To achieve this objective, the researcher designed a number of questions/statements with the aim of

obtaining relevant information concerning downstream supply chain challenges among oil marketing companies.

Firstly, the study sought to know the role the selected oil marketing companies played in petroleum industry. This is because downstream supply chain activities in petroleum industry cut across various sectors, ranging from; distribution, supplying, purchasing, transportation, storage, retailing, and management. The study findings on the role played by the selected oil marketing companies in petroleum industry are shown in Figure 4.4.

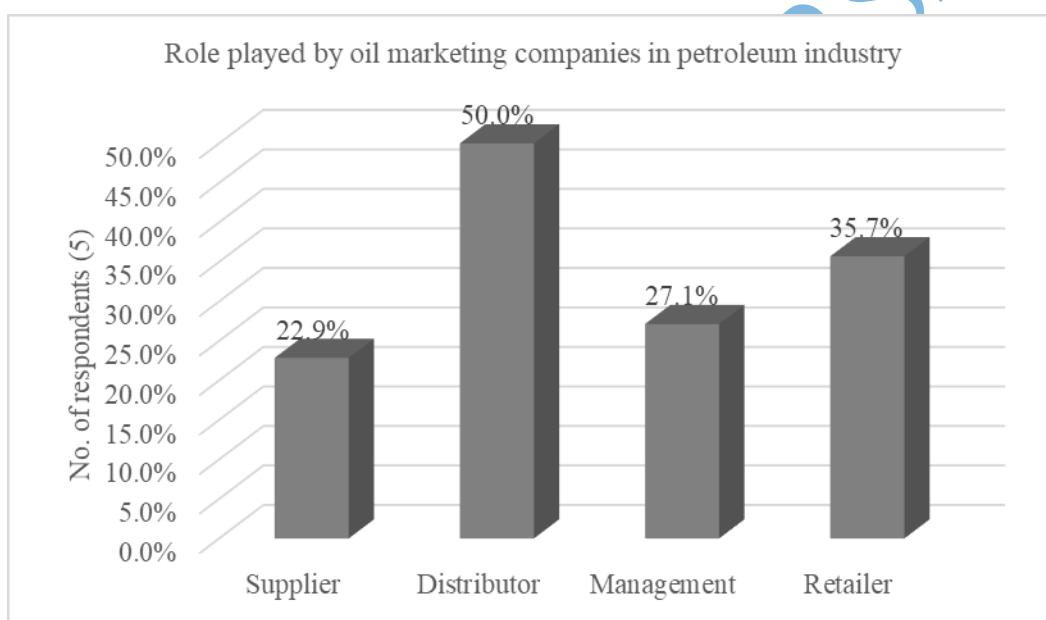


Figure 4.4: Role Played in the Petroleum Industry

As per the findings in Figure 4.4, most of the selected oil marketing companies in Nairobi County at 50% operate as distributors of oil products, 35.7% operate as retailers, 27.1% carry out the management functions, while 22.9% are suppliers of oil products. The total percentages is more than 100% because there are oil marketing companies where employees indicated that they play more than one role, for example, a company can be a distributor and retailer or a supplier. These findings have shown

that oil marketing companies play different role in the petroleum industry, thus, a wide range of downstream supply challenges which can affect their performance. The downstream supply chain challenges can be experienced at the management level, during distribution, supplying activities, or at retail point.

Secondly, the researcher sought to establish whether oil marketing companies experience downstream chain challenges in carrying out their roles and activities in the petroleum industry. Therefore, the researcher asked the respondents to indicate whether their respective oil marketing companies experience downstream chain challenges. Their responses were as shown in Figure 4.5.

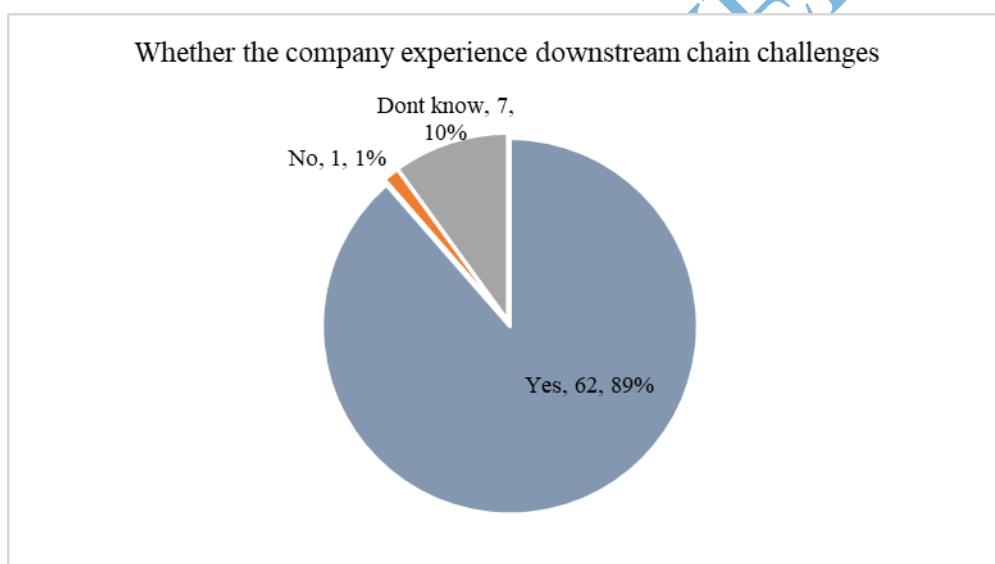


Figure 4.5: Whether Oil Marketing Companies Experience Downstream Chain Challenges

The findings in Figure 4.5 show that an overwhelming majority of the respondents at 62(89%) agreed that indeed the oil marketing companies they worked for experienced downstream supply chain challenges. A few of the respondents at 7(10%) indicated that they were not aware whether their oil marketing companies experienced downstream supply chain challenges, while the minority (1%) denied that the company he/she worked for experienced downstream supply chain challenges. In

support of these findings, all the five (5) key informants that participated in in-depth interviews agreed that their companies experienced downstream supply chain challenges. Based on these findings, it is evident that various oil marketing companies in Nairobi County experience downstream supply chain challenges, thus, the relevance of this study in investigating the effect of those challenges on performance of the companies.

Thirdly, the study sought to know the specific downstream supply chain challenges experienced by oil marketing companies in Nairobi County. For easy analysis, the researcher provided the respondents with a list of common downstream supply chain challenges and asked them to indicate the extent to which they agree or disagreed that their company experience such challenges. The findings are as shown in Table 4.5.

Table 4.4: Downstream Supply Chain Challenges

Downstream supply chain challenges	SA	A	N	D	SD	Total	
Unprocedural tendering system	N %	38 54.3	24 34.3	7 10.0	1 1.4	0 0	70 100
Frequent fluctuation of international oil prices	N %	29 41.4	30 42.9	6 8.6	5 7.1	0 0	70 100
Logistics challenges such as long process cycle	N %	22 31.4	38 54.3	9 12.9	1 1.4	0 0	70 100
Lack of an integrated management process	N %	15 21.4	37 52.9	16 22.9	2 2.9	0 0	70 100

SA=Strongly agree, A=Agree, N=Neutral, D=Disagree, SD=Strongly disagree

From the finding in Table 4.5, a majority of the respondents generally agreed (strongly agreed + agreed) that the following are the downstream supply chain challenges that their oil marketing companies experience: unprocedural tendering systems at 62(88.6%); frequent fluctuation of international oil prices at 59(84%); logistics challenges such as long process cycle at 60(85.7%), and lack of an integrated management process at 52(74.3%). Very few respondents disagreed that their

companies did not experience the highlighted downstream supply chain challenges.

These findings show that many oil marketing companies in Nairobi County experience four major downstream supply chain challenges, namely; tendering systems challenges, fluctuation and regulation of international oil prices, logistics challenges, and lack of an integrated process management system.

The study further asked respondents to highlight any other downstream supply chain challenges apart from the four that were listed in Table 4.5. The respondents provided a wide range of downstream supply chain challenges, which the respective oil marketing companies experience and they were as summarized in Table 4.6.

Table 4.5: Other Downstream Supply Chain Challenges (n=70)

Other downstream supply chain challenges	No. of responses	Percentage
Inadequate storage capacity e.g. space, oil tanks etc.	12	21.10%
Lack of continuity in supply	10	17.50%
Inadequate planning due to poor management and leadership	9	15.80%
Uncontrolled competitive market in petroleum industry	8	14.00%
Lack of inadequate procurement experts/officers/skills	7	12.30%
Frequent shortage of key oil products to delays in supply	7	12.30%
Excess inventory leading to losses	7	12.30%
Inadequate stock-taking	6	10.50%
Lack of a proper ICT system to manage orders and supplies	6	10.50%
Warehousing management challenges	6	10.50%
Customer demand fluctuations	6	10.50%
Lack of procurement experts/officers	4	7.00%
Multiple marketing channels for oil marketing companies	4	7.00%
Poor customer relations	4	7.00%
Risk management e.g. disasters	4	7.00%
Poor coordination between supply chain team and other departments	2	3.50%
Poor sourcing choices	2	3.50%
Location of facilities	2	3.50%
Accepting poor quality products	1	1.80%
Unclear/inadequate contracts with suppliers	1	1.80%

From the findings in Table 4.6, it is evident that oil marketing companies in Nairobi County experience other downstream supply chain challenges. These challenges include; inadequate storage capacity such as oil tanks (21.1%), lack of continuity in supply (17.5%), inadequate planning due to poor management and leadership (15.8%), and uncontrolled competitive market in petroleum industry (14.0%). Other challenges are; lack of inadequate procurement experts/officers/skills to handle supply chain functions, frequent shortage of key oil products due to delays in supply, excess inventory leading to losses among other challenges as shown in the table in a descending order.

In addition, the in-depth interviews with managers/directors of the selected oil marketing companies supported the findings from the employees on the downstream supply chain challenges experienced by oil marketing companies. For instance, Manager 1 said the following when asked to highlight and explain types of downstream supply chain challenges experienced his company:

"There are many downstream supply chain challenges that our company experience on a daily basis. First, our company lacks an integrated ICT system to manage purchases, sales, stock, consumer queries, and inventories among other ICT related activities. Secondly, the current prices of oil products such as petrol is very high leading to decreased number of customers, however, we have not control of the prices since they are regulated internationally. Thirdly, in most cases we experience delays in deliveries leading to inconvenience especially for the customers, and this leads to customer loss."

Manager 2 also responded as follows;

The downstream supply chain challenges that our company experience are mostly; accountability and compliance management, increased cost due to multiple channels involved for distribution of oil products, storage challenges such lack of enough storage capacity for petrol which is highly consumed, and insecurity issues due to lack of high-technology security surveillances."

These findings have revealed that oil marketing companies are struggling as a result of downstream supply chain challenges they are experiencing. This could be affecting their growth and development, which in turn affects the larger petroleum industry and the overall economic growth of the country.

Coping with Downstream Supply Chain Challenges

The second objective of the study sought to establish how oil marketing companies in Nairobi County cope with downstream supply chain challenges. To achieve this objective, the researcher asked the respondents to highlight how their respective oil marketing companies coped with downstream supply chain challenges they were experienced. The findings are summarized in the Table 4.7.

Table 4.6: Ways of Coping with Downstream Supply Chain Challenges (n=70)

Ways of coping with downstream supply chain challenges	No. of responses	Percentage
Purchasing of high quality products and in bulk	13	23.60%
Outsourcing of services and using multiple suppliers	12	21.80%
Partnering with other fuel services with experience in logistics planning	11	20.00%
Provision of quality services by having good controls in place	9	16.40%
Building a customer-focused culture to maintain customer	9	16.40%
Use of technology to manage inventories and control fleets	9	16.40%
Hiring of professional supply chain managers to help in tendering	8	14.50%
Use of available resources and facilities	7	12.70%
Use of building extensions for storage	5	9.10%
Having a proper transportation system	4	7.30%
Use of Manual tendering (single-sourcing)	3	5.50%
Manual stock-taking	3	5.50%
Conducting rewards and routine maintenance of systems	3	5.50%
Demand forecasting	3	5.50%

From the finding in Table 4.7, the three major strategies adopted by the oil marketing companies in Nairobi County to cope with downstream supply chain challenges experienced included: Purchasing of high quality product and in bulk (23.6%),

outsourcing of services and using of multiple suppliers (21.8%), and partnering with other oil marketing companies with experience in logistics and planning to help in logistics and planning challenges (20%). Other ways of coping with downstream supply chain challenges include; provision of quality services by having good controls in place, building a customer-focused culture to maintain customer, use of technology to manage inventories, control fleets and other related activities among other ways as shown in the table in a descending order.

Study findings from in-depth interviews with managers/directors of the selected oil marketing companies in Nairobi County also revealed other ways used by the companies to cope with downstream supply chain challenges experienced. For example, Manager 3 said the following;

“For us, we are using manual means to manage and store our data since we do not have an integrated supply chain management system. On the supplying and distribution issues, we have increased the number of suppliers so that each supplier hands specific oil products instead of using one or two suppliers for a products who ends up failing us when we urgently need the products.”

Manager 5 explained as below:

“Inadequate storage is our main supply chain challenge. As a remedy, we use containers to store non-fluid oil products. We have also constructed extensions in our facilities to accommodate more products. Additionally, we are constructing an extra storage tanks for oil to mitigate storage challenges.”

These findings have demonstrated that despite oil marketing companies struggling due to downstream supply chain challenges they are experiencing, they have designed ways of coping with the challenges, which is as a short-term remedy. Therefore, there is need for research to be conducted to provide oil marketing companies with strategies that offer long-term solutions to the downstream supply chain challenges.

Effect of the Challenges on the Performance of Oil Marketing Companies

The third objective of study was to examine the effects of downstream supply chain challenges on performance of oil marketing companies in Nairobi County. The researcher designed statements that show common effects of downstream supply chain challenges experienced by companies worldwide. Respondents were asked to indicate the extent to which they agreed or disagreed to statements listed in reference to their respective oil marketing companies. The findings were as shown in Table 4.8.

Table 4.7: Effect of Downstream Supply Chain Challenges on Performance of Companies

Effects							Total
	SA N	A %	N	D	SD		
Downstream supply chain challenges affect our company's competitive advantage through price/cost, quality, delivery dependability, time to market, and product innovation	37 52.9	26 37.1	4 5.7	3 4.3	0 0	70 100.0	
Ineffective information sharing in our company has led to low levels of supply chain integration thus forcing our company management to make unreliable deliveries and taking long to introduce products to the market.	18 25.7	44 62.9	3 4.3	5 7.1	0 0	70 100.0	
Lack of postponement or delay strategy in our company reduces flexibility in the supply chain and imbalances global efficiency and customer responsiveness	14 20.0	42 60.0	9 12.9	4 5.7	1 1.4	70 100.0	
Increased government regulations in the downstream supply chain process have led to ineffective performance of our company	22 31.4	35 50.0	9 12.9	4 5.9	0 0	70 100.0	
Lack of cost saving during transportation of the company's products has led to poor performance	22 31.4	36 51.4	6 8.6	6 8.6	0 0	70 100.0	
Inadequate storage oil and other petroleum products has led to poor performance of our company	20 28.6	34 48.6	9 12.9	7 10.0	0 0	70 100.0	
Inadequate infrastructure like roads has hindered effective performance of oil marketing companies	15 21.4	38 54.3	7 10.0	10 14.3	0 0	70 100.0	

As per the Findings in Table 4.8, most(more than 75%) of the respondents ‘agreed’ and ‘strongly agreed’ that the various downstream supply chain challenges experienced by their oil marketing companies had led to the following effects: Reduction in company’s competitive advantage; low levels of supply chain integration; reduction in flexibility in the supply chain and imbalances inn global efficiency and customer responsiveness; and poor performance of the companies due to increased government regulations in the downstream supply chain process, lack of cost saving during transportation of products has let to poor performance, inadequate storage facilities, and inadequate infrastructure like roads.

On competitive advantage, 37(52.9%) of the respondents strongly agreed that downstream supply chain challenges affect their company’s competitive advantage through price/cost, quality, delivery dependability, time to market, and product innovation. This was supported by 26(37.1%) of respondents who agreed. A few of the respondents at 4(5.7%) were undecided, while 3(4.3%) disagreed that there was reduction in competitive advantage as a result of downstream supply chain challenges.

On supply chain integration, 18(25.7%) of the respondents strongly agreed that ineffective information sharing in their companies led to low levels of supply chain integration, thus, forcing the company managements to make unreliable deliveries and taking long to introduce products to the market. This was backed up by 44(62.9%) of the respondents who generally agreed on the same. However, a few respondents at 5(7.1%) disagreed while 3(4.3%) were undecided on the fact ineffective information sharing in their companies led to low levels of supply chain integration.

On flexibility in the supply chain, imbalances in global efficiency, and customer responsiveness, the findings show that an overwhelming majority of the respondents

at 56(80%) ‘agreed’ and ‘strongly agreed’ that lack of postponement or delay strategy in various oil marketing companies reduces flexibility in the supply chain, imbalances in global efficiency, and decreased customer responsiveness, against 5(7.1%) of the respondents who disagreed.

In regards to company performance based on government regulations, 57(81.4%) of the respondents ‘agreed’ and ‘strongly agreed’ that increased government regulations in the downstream supply chain processes have hindered performance of various oil marketing companies. On the same issue, however, a few of the respondents 9(12.9%) were undecided while 4(5.9) disagreed.

On company performance based on savings on transportation costs, a bigger number of the respondents at 56(82.8%) ‘strongly agreed’ and ‘agreed’ that lack of cost saving during transportation of the company’s products had led to poor performance, thus, experiencing some low profitability. However, 6(8.6%) of the respondents disagreed to the same, while 6(8.6%) were undecided.

On storage capacities and performance of the companies, the majority at 54(87.2%) of the respondents ‘strongly agreed’ and ‘agreed’ that inadequate storage of oil and other petroleum products had led to poor performance of various oil companies, however, 7(10%) of the respondents disagreed to the same. This implies that oil marketing companies experience inefficiencies yet the consumer demand is high.

Lastly on infrastructure and performance of oil marketing companies, 53(75.7%) of respondents ‘strongly agreed’ and ‘agreed’ that inadequate infrastructure like roads, water systems, sewerage, among others had hindered effective performance of oil marketing companies. However, 11(15.7%) of the respondents disagreed while 7(10%) neither agreed nor disagreed.

The study further sought to establish other effects of downstream supply chain challenges on performance of companies. In view of this, besides factors listed in Table 4.8, other identified factors were as summarized in Table 4.9.

Table 4.8: Other effect of Downstream Supply Chain Challenges on Performance of Companies (n=70)

Other effects	No. of responses	Percentage
Losing customers due to inconveniences caused by shortages and delays in supply	15	51.70%
Decrease in profit margins and market share due to customer dissatisfaction	8	27.60%
Inventory tracking system challenges	8	27.60%
Ineffective service delivery due supply chain challenges	5	17.20%
Tying of capital in stock	3	10.30%
Increased cost of holding stock	3	10.30%

From Table 4.9, 15(51.70%) of the respondents indicated that their companies were losing customers due to inconveniences caused by shortages and delays in supply, thus, affecting overall performance of oil marketing companies. Other effect of downstream supply chain challenges were; decrease in profit margins and market share due to customer dissatisfaction (27.6%), inventory tracking system challenges (27.6%), ineffective service delivery due supply chain challenges (17.20%), tying of capital in stock (10.3%), and increased cost of holding stock (10.3%).

Findings from in-depth interviews with the managers/directors also revealed that the performance of oil marketing companies in Nairobi County is highly affected by downstream supply chain challenges experienced. In addition to what the employees highlighted, the managers/directors also noted other effects of downstream supply chain challenges on performance of oil marketing companies in Nairobi County:

Manager 1 explained as follows:

“Our company is experiencing low growth rate because of strict government regulations on businesses in the petroleum industry. The government regulations are costly, especially on tax of petroleum products, licenses required to operate a petrol station, and price regulations on oil products such as petrol, diesel, and kerosene. In addition, our infrastructure especially roads is not adequate because petrol stations must be located in strategic places where oil tankers must access. Most of the areas in Nairobi County are not accessible.”

Manager 2 explained as follows:

“We have experienced a decrease in our market share due to uncontrolled competition from emerging companies in the oil industry. These companies utilize people’s unawareness of the quality of oil products and sell products that are of low quality and a cheap price. The government and regulatory bodies are not doing anything to tame such low quality products from the market, thus, making some companies like ours to lose customers as they opt for cheap products.”

Manager 3 noted as below:

“Proper planning, coordination and monitoring of oil businesses is key to success of any oil marketing company. However, most of the oil marketing companies, especially petrol stations do not have qualified personnel to handle provide business plans, coordinate and monitor their business activities. For example, supply chain processes require experts to handle them because they are key to a company’s success. Supply chain processes attract a lot of corruption, hence, when a company does not have the right personnel, it experiences slow business growth or sometimes close down due to loss in terms of profits, customer base, and market share”.

Manager 4 reiterated as follows:

“Poor management of the supply chain processes lead to ineffective stock inventory and corruption within the company especially on tendering and logistics systems. When a company experiences too much corruption especially on tendering and logistics processes, it records losses and stagnant growth, which may lead to closure”.

Manager 5 also note as follows:

“Increased government regulations in the oil business is a hindrance to growth of companies in petroleum industry. Some companies can-not manage to adhere to the government regulations. This leads to most companies carrying out dubious and illegal businesses in purchasing, storage, supplying, and distribution of oil products. This interferes with the supply chain processes of other companies competing with such companies, thus, leading to poor performances.”

The study findings on the effects of downstream supply chain challenges have shown that oil marketing companies in Nairobi County are suffering as a result of the challenges. Their performance is highly affected by the downstream supply chain challenges, thus, the need for long-term solutions to be found.

Performance of Oil Marketing Companies

The study sought to ascertain the performance of oil marketing companies using sales volume, market share, and cost and service leadership as the performance indicators. The respondents were asked to indicate the extent to which they agreed or disagreed on the statement listed regarding performance of their respective companies based on the three performance indicators.

Table 4.9: Performance of Oil Marketing Companies

Performance		SA	A	N	D	SD	Total
		N	%	N	%	N	%
Effective downstream supply chain management has led to increased sales volume in your company		4	5.7	8	11.4	8	11.4
Effective downstream supply chain management has enabled our company to have bigger market share		8	11.4	15	21.4	6	8.6
There is effective cost and service leadership in our company		5	7.1	19	27.1	8	11.4
		%		%		%	
		23	32.9	21	30	21	30
							100
		25	35.7	25	22.9	16	24.3
							70

According to the findings in Table 4.10, only 18(25.7%) of the respondents ‘strongly agreed’ and ‘agreed’ that effective downstream supply chain management has led to increased sales volume in their companies while most of the respondents at 44(62.9%) ‘strongly disagreed’ and ‘disagreed’ to the same. On market share, most of the respondents at 51(56.6%) ‘strongly disagreed’ and ‘disagreed’ that effective downstream supply chain management has enabled their companies to have bigger market share while 24(34.2) ‘agreed’ and ‘strongly agreed’ to the same. With regards

cost and service leadership in oil marketing companies, most of the respondents at 28(54.3%) ‘strongly disagreed’ and ‘disagreed’ that there is effective cost and service leadership in their companies as a result of effective downstream supply chain management, while 24(34.2%) ‘agreed’ and ‘strongly agreed’ to the same. These findings have demonstrated that performance of oil marketing companies in Nairobi County, in terms of sales volume, market share, and cost and service leadership, is not effective due to ineffective downstream supply chain management. This could be attributed to various challenges the companies are experienced as was revealed earlier on.

Relationship between Downstream Supply Chain Challenges and Performance of Oil Marketing Companies

After establishing the challenges of downstream supply chain, their effect on performance on oil marketing companies, and the performance status of the companies, the study sought to find out the relationship between relationship between downstream supply chain challenges and performance of oil marketing companies. This was to further demonstrate the effect of oil downstream supply challenges on performance of oil marketing companies in Nairobi County. To achieve this, the researcher conducted a Pearson’s correlational analysis between the independent variables (downstream supply chain challenges) and dependent variable (performance of oil marketing companies). The independent variables that were used in this case to measure downstream supply chain challenges include; tendering systems, international oil prices, logistics issues, and integrated process management. On the other hand, the dependent variables that were used to measure performance of oil

marketing companies were sales volume, market share, and cost and service leadership.

As a rule of the thumb, a Pearson correlation coefficient (r) of 0-0.2 implies that there is no relationship between two measured variables; $r = 0.3-0.4$ implies that there is positive but weak relationship, $r=0.5-0.6$ implies that there is a positive but moderate relationship, $r=0.6-0.7$ implies that there is a positive and strong relationship, while $0.8-0.9$ implies that there is a positive and very strong relationship between the two variables being measured. Any correlation between two variables is considered statistically significant if the statistical significance coefficient (p) is less or equal to 0.05. The finding of the Pearson correlation analysis between downstream supply chain challenges and performance of oil marketing companies in Nairobi County were as shown in Table 4.11.

Table 4.10: Pearson correlational analysis between Downstream Supply Chain Challenges and Performance of Oil Marketing Companies

Downstream supply chain challenges	Performance of Oil Marketing Companies		
	Sales volume	Market share	Cost and service leadership
Tendering systems	Pearson Correlation	.778 **	.722 **
	Sig. (2-tailed)	.000	.000
	N	70	70
International oil prices	Pearson Correlation	.776 *	.606 **
	Sig. (2-tailed)	.021	.010
	N	70	70
Logistics	Pearson Correlation	.868 *	.690
	Sig. (2-tailed)	.000	.015
	N	70	70
Integrated process management	Pearson Correlation	.637 *	.712 **
	Sig. (2-tailed)	.004	.009
	N	70	70

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

The Pearson's correlation matrix results shown in Table 4.11 shows that there is positive and strong relationship between independent variables (downstream supply

chain challenges) and the dependent variables (measures of performance of oil marketing companies in Nairobi County) since the Pearson Correlation Coefficient (r) for all the variables range between $r=0.6-0.8$. The relationship between the variables measured is statistically significant since the statistical significant coefficient (p) at 95% confidence level is $p \leq 0.05$ which is the acceptable significance coefficient for a statistically significant relationship. This finding implies that downstream supply chain challenges experienced by oil marketing companies in Nairobi County greatly influence performance of the companies in terms of sales volume, market share, and cost and service leadership. Therefore, oil marketing companies should look design and implement plans that offer lasting solutions to downstream supply chain challenges if they need to improve their performance.

Curbing the Downstream Supply Chain Challenges

The last objective of the study was to propose measures that can be put in place to curb downstream supply chain challenges that are affecting performance of oil marketing companies in Nairobi County. Therefore, the respondents were asked to indicate the measures that can be put in place to curb the downstream supply chain challenges experienced in their respective companies. The findings were as shown in Table 4.12.

Table 4.11: Measure to Curb the Downstream Supply Chain Challenges

Measures	No. of responses	Percentage s
Use of integrated ICT system	16	32.00%
Continuity in supply - ensuring no shortages in supply	15	30.00%
Good customer relations	14	28.00%
Employing experts and professionals in supply chain management	13	26.00%
Subsidized/controlled oil prices	8	16.00%
Proper supply chain management system	6	12.00%
Adequate stock-taking and inventory	6	12.00%
Having employee workshops/seminars/training programs on supply chain management	5	10.00%
Proper leadership and management	4	8.00%
Effective regulation of oil prices	3	6.00%
Having a pack-up transportation plan	3	6.00%
Adequate storage facilities	1	2.00%

As shown in Table 4.12, major measures suggested to be put in place by oil marketing companies in Nairobi County to curb the downstream supply chain challenges they are experiencing include; use of integrated ICT system (32%), continuity in supply to ensure no shortages in supply (30%), maintain good customer relations (28%), and employing experts and professionals in supply chain management (26%). Other measures that can be put in place include; subsidizing and controlling oil prices (16%), implement proper supply chain management system (12%), adequate stock-taking and inventory (12%), having employee workshops/seminars/training programs on supply chain management (10%) among other measures as shown in the table in a descending order.

Further findings from in-depth interviews with managers/directors of the selected oil marketing companies in Nairobi County revealed other measures they are putting in place or can be put in place to overcome downstream supply chain challenges, which are affecting their performance. For instance, Manager 1 said the following;

We are currently installing an integrated ICT system to ensure all the supply chain activities are integrated in one supply chain digital system. This will improve accountability, transparency, customer services and information flow. In addition, the ICT system security through surveillance systems, cut unnecessary transportation costs, and improve company operations.

Manager 2 said the following:

Our major issue was storage capacity. Therefore, we are currently constructing extra storage tanks for petrol and diesel oils in order to mitigate storage capacity challenges. In transportation sector, the company is planning to purchases two vehicles that will be helping us during purchases, supplying, and distribution of oil products to our customers.

Manager 3 hinted as below:

We are more concerned with the implementation of well-developed employee training programs to improve labor skills, especially on expertise and professionalism in supply chain management. This will increase professionalism at work and enhance overall performance of the company. In addition, we will be hiring experts and professionals to handle the supply chain activities.

Manager 4 put more emphasis on working on customer relations, ensuring continuity in supply, and employing professionals in the supply chain sector. Manager 5 echoed these sentiments, but in addition, the manager reiterated that there is need for proper planning from leadership and management, as well as proper regulation of oil prices internationally and nationally.

These findings have demonstrated that there many ways oil marketing companies can utilize to effectively curb the downstream supply challenges, which are greatly affecting their performance. The ideas and proposals are available, only proper leadership is required to implement them and forget about downstream supply chain challenges.

Summary of Key Findings

1. Most of the respondents generally agreed that unprocedural tendering systems at 62(88.6%), frequent fluctuation of international oil prices (84%), logistics challenges such as long process cycles (85.7%), and lack of an integrated management process 52(74.3%) are the major downstream supply chain challenges that their oil marketing companies experienced. Other downstream supply chain challenges experienced include; inadequate storage capacity (21.1%), lack of continuity in supply (17.5%), inadequate planning due to poor management and leadership (15.8%), uncontrolled competitive market in petroleum industry (14.0%), among others.
2. Three major ways oil marketing companies in Nairobi County are using to cope with downstream supply chain challenges they experience include: Purchasing of high quality product and in bulk (23.6%), outsourcing of services and using of multiple suppliers (21.8%), and partnering with other oil marketing companies with experience in logistics and planning to help in logistics and planning challenges (20%). Other ways of coping with downstream supply chain challenges include; provision of quality services by having good controls in place, building a customer-focused culture to maintain customer, use of technology to manage inventories, control fleets and other related activities among other ways as shown in the table in a descending order.
3. Major effects of downstream supply chain challenges on performance of oil marketing companies include; reduction in company's competitive advantage (90%), low levels of supply chain integration (88.6%); reduction in flexibility in the supply chain and imbalances in global efficiency and customer responsiveness (80.0%), and poor performance of the companies due to increased government

regulations in the downstream supply chain process (81.4%), lack of cost saving during transportation of products has led to poor performance (82.8%), inadequate storage facilities (77.2%), and inadequate infrastructure like roads (75.7%).

4. Other effects of downstream supply chain challenges on performance of oil marketing companies were; losing customers due to inconveniences caused by shortages and delays in supply (51.7%), decrease in profit margins and market share due to customer dissatisfaction (27.6%), inventory tracking system challenges (27.6%), ineffective service delivery due supply chain challenges (17.20%), tying of capital in stock (10.3%), and increased cost of holding stock (10.3%).
5. On performance, most of the respondents 44(62.9%) generally disagreed that effective downstream supply chain management has led to increased sales volume in their companies 51(56.6%) disagreed that effective downstream supply chain management has enabled their companies to have bigger market share, and 28(54.3%) disagreed that there is effective cost and service leadership in their companies as a result of effective downstream supply chain management
6. The Pearson's correlation matrix results showed that there is positive and strong relationship between downstream supply chain challenge) and performance of oil marketing companies in Nairobi County (Pearson Correlation Coefficient $r=0.6-0.8$, $p \leq 0.05$).
7. Major measures that can be put in place by oil marketing companies in Nairobi County to curb the downstream supply chain challenges they are experiencing include; use of integrated ICT system (32%), continuity in supply to ensure no shortages in supply (30%), maintain good customer relations (28%), and employing experts and professionals in supply chain management (26%). Other

measures that can be put in place include; subsidizing and controlling oil prices (16%), implement proper supply chain management system (12%), adequate stock-taking and inventory (12%), having employee workshops/seminars/training programs on supply chain management (10%) among other measures as shown in the table in a descending order.

Summary

This chapter has explicitly presented, analysed and interpreted the study findings that were obtained during data collection exercise. The focus was the demographic information of the respondents that was of interest for this study, the challenges experienced by oil marketing companies in Nairobi County, ways of coping with the challenges, the effect of the challenges on performance of the companies, the relationship between the challenges and performance of the companies, and measures that can be put in place to curb the challenges. A summary of the findings was also provided. The next chapter discusses the key findings in relation to previous empirical literature, provide the study conclusions, and recommendations.

CHAPTER FIVE

DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

Introduction

In this chapter, key findings of the study are discussed in relation to existing general and empirical literature as provided in Chapter Two. The discussion is done based on the objectives of the study. The chapter will then provide conclusions and recommendations of the study.

Discussion of the Key Findings

The discussion of the key findings is guided by the study objectives. The objectives were; to establish downstream supply chain challenges experienced by oil marketing companies, establish what oil marketing companies employ to cope with the downstream supply chain challenges, examine the effects of downstream supply chain challenges on performance of oil marketing companies, and propose measures that can be put in place to curb downstream supply chain challenges affecting performance of oil marketing companies in Nairobi County.

Downstream Supply Chain Challenges

This study established that marketing firms in the petroleum industry operating in Nairobi are experiencing a wide range of downstream supply chain challenges. The major challenges experienced included; unprocedural tendering systems at 62(88.6%), frequent fluctuation of international oil prices (84%), logistics challenges such as long process cycle (85.7%), and lack of an integrated management process 52(74.3%). Additionally, the oil marketing experienced other challenges, such as; inadequate storage capacity (21.1%), lack of continuity in supply (17.5%), inadequate planning

due to poor management and leadership (15.8%), uncontrolled competitive market in petroleum industry (14.0%) among others. This is a clear fact that indeed oil marketing companies in Nairobi County, and Kenya at large, are struggling in their efforts to facilitate and development of the petroleum industry.

These study findings are supported by previous literature on challenges experienced by oil companies in the petroleum industry. For instance, a study by Chen (2014) in China found that petroleum prices are volatile, making businesses to suffer from frequent fluctuations in oil prices. Chen (2014) further found that Government interference in the oil marketing sector hinders free markets, making the sector uncompetitive. Similarly, Nginga (2013) found that government regulations and investor security were indicated as the main difficulties and concerns facing the foreign investors in the petroleum industry in Kenya. On the same note, Mutuma (2009) who found that although the Government has taken major steps to create a framework that guarantees the security of investors in oil exploration and production sector, the resultant framework is far from adequate and efficient. This was in line with finding in the current study that government regulations in the oil marketing sector was a major hindrance on growth and development of oil marketing companies in Nairobi County.

Correspondingly, a study by Amponsah and Opei (2014) in Ghana revealed that failure of the government to pay under recoveries, inadequate infrastructure and inability of the Tema Oil Refinery to produce petroleum products that meet the expectations of the marketers and consumers were the major downstream supply challenges experienced by oil companies. In addition, Amponsah and Opei, (2014) noted that in as much as petroleum consumption in Ghana increased, the supply of

petroleum product was always low. These findings concur with the current study findings, which revealed that lack of continuity in supply of petroleum products such oil was a hindrance in the oil marketing business.

In Kenya, a study by Osoro (2016) noted that globalization has intensified competition in the petroleum industry and it has made increased movement of highly educated personnel, yet companies in petroleum industry rely on their employees for growth, sustainability, and general success without considering they are skilled or not. Osoro further found level of skills among staff negatively affected the performance of supply chain among companies in the petroleum industry. Therefore, Osoro's study brought to the fore, the role of skills and its effect on oil marketing companies' performance. This was also pointed out by the current study, which revealed that lack of competent and professionals in the supply chain management contributed to downstream chain challenges experienced by oil marketing companies, thus, negatively influencing the companies' performance in terms sales volume, market share, and cost and service leadership. This, therefore, imply that the presences of skilled personnel in oil marketing companies, especially in the supply chain management helps in curbing supply chains challenges.

Coping with Downstream Supply Chain Challenges

From the study findings, there are three major strategies employed by oil marketing companies to cope with downstream supply chain challenges they experience. They include; purchasing of high quality product and in bulk (23.6%), outsourcing of services and using of multiple suppliers (21.8%), and partnering with other oil marketing companies with experience in logistics and planning to help in logistics and planning (20%). In addition, oil marketing companies opt to; provide quality services

by having good controls in place, build a customer-focused culture to maintain the customer base, use technology to manage inventories, control fleets and other related activities among other ways. This implies that oil marketing companies are putting some effort to ensure that the downstream supply chain challenges do not affect their performance. However, the findings showed that the downstream supply challenges are greatly affecting performance of the oil marketing companies in Nairobi County.

Previous literature reviewed supports this study's findings that oil marketing companies have adopted ways and strategies of coping with supply chain challenges they experience. For instance, Barua (2010) found that some oil marketing companies have adopted third party logistics (3PL), close partnership with suppliers, electronic procurement, and outsourcing practices in order to cope with downstream supply chain challenges. As per this study's findings, oil marketing companies in Nairobi County have adopted similar practices to cope with the pressing downstream supply chain challenges they are experiencing. For instance, the current study noted that 20% of the oil marketing companies in Nairobi County had resolved into partnering with other oil marketing companies with experience in logistics and planning to help them with logistics and planning. Likewise, the study found that 21.8% of the oil marketing companies in Nairobi had resolved into outsourcing of services and using of multiple suppliers to deal with the challenge of lack of continuity in supply of petroleum products as per the consumer demand.

In line with the current study findings, another way of coping with the downstream supply chain challenges is through the use sophisticated information technology. This is according to Morton (2013) who proposed that having a sophisticated information technology is essential for petroleum marketing companies due to supply chain

challenges related to security. Petroleum companies ship a great deal of hazardous products, therefore, use of a sophisticated information technology by oil marketing companies enables their partners in the supply chain cycle especially their clients to be conversant with their specific locations of every shipment at any specific time.

Further, in line with the study findings, Chopra and Meindl (2008) also noted that oil and petrochemical companies around the world cope with downstream supply chain challenges by applying swapping technique. This technique take different forms: Asset swapping, business swapping, and shipment swapping (Chopra & Meindl, 2008). Supply chain includes not only the producers and the suppliers, but also the transporters, warehouses, retailers, and even the customers themselves. Therefore, the swapping technique helps a company to explore seriously the potential of supply chain concept, thus, realizing a significant revenue growth. Consequently, using a swapping technique as a supply chain strategies, the firm can save about 10 percent of its annual operation costs (Barua, 2010).

Effects of Downstream Supply Chain Challenges on Company Performance

This study established that the major effects of downstream supply chain challenges on performance of oil marketing companies include; reduction in company's competitive advantage (90%), low levels of supply chain integration (88.6%), lack of cost saving during transportation of products has led to poor performance (82.8%), and reduction in flexibility in the supply chain and imbalances in global efficiency and customer responsiveness (80.0%). In addition, the study established there is poor performance of the companies due to increased government regulations in the downstream supply chain process (81.4%), inadequate storage facilities (77.2%), and inadequate infrastructure like roads (75.7%). Other effects as established by this study

include; losing customers due to inconveniences caused by shortages and delays in supply (51.7%), decrease in profit margins and market share due to customer dissatisfaction (27.6%), inventory tracking system challenges (27.6%), ineffective service delivery due supply chain challenges (17.20%), tying of capital in stock (10.3%), and increased cost of holding stock (10.3%).

Similarly to this study's findings, Mwala (2014) also found that downstream supply chain challenges experienced by oil companies, such as lack of continuous supply of oil products and inadequate logistics systems, negatively affect performance of the companies by increasing lead times and high production and distribution costs. Mwala further noted that downstream supply chain challenges impact not only overall organizational performance, but also competitive advantage of an organization (Mwale, 2014). This concurs with the study findings which established that 90% of the competitive advantage of oil marketing companies of Nairobi County is highly affected by downstream supply challenges. Similarly, a previous study by Power (2011) revealed that a company's competitive advantage is highly affected by various challenges caused by improper downstream supply chain management.

According to Lee (2009), downstream supply chain challenges arising from inadequate information sharing leads to low levels of supply chain integration in companies. This forces a company or organization to make unreliable deliveries and take long before introducing products to the market. Lee further noted that information sharing and information quality contribute positively to customer satisfaction and partnership quality. This is the case with oil marketing companies in Nairobi County; this study established the companies lost customers due to inconveniences caused by shortages and delays in supply (51.7%), profits and market

share decreased due to customer dissatisfaction (27.6%), and there was ineffective service delivery due supply chain challenges (17.20%).

Further, on the effect of creation of imbalances in global efficiency and customer responsiveness due to lack of postponement or delay strategy, Van (2009) support this finding by noting that delay strategy decreases the flexibility in the supply chain. Firms with high levels of supply chain management practices will have high levels of competitive advantage. Having a competitive advantage generally suggests that an organization can have one or more of the following capabilities when compared to its competitors: lower prices, higher quality, higher dependability, and shorter delivery time. These capabilities will, in turn, enhance the organization's overall performance (Mentzer, 2010). Competitive advantage can lead to high levels of economic performance, customer satisfaction and loyalty, and relationship effectiveness. Brands with higher consumer loyalty face less competitive switching in their target segments thereby increasing sales and profitability (Moran & Gossieaux, 2010).

From the Pearson's correlation matrix results, this study established that there is positive and strong relationship between downstream supply chain challenge) and performance of oil marketing companies in Nairobi County (Pearson Correlation Coefficient $r=0.6-0.8$, $p \leq 0.05$). This supports Mwale's (2014) study, which also found that there is a significant positive relationship between supply chain management practices and organizational performance as explained by the seven independent variables, namely strategic supplier partnership, customer relationship, level of information sharing, quality of information, extent of outsourcing, lean practices and postponement. Therefore, it is probable to argue downstream supply chain challenges are directly associated with performance of oil marketing companies.

Measures to curb Downstream Supply Chain Challenges

According to this study's findings, major measures that can be put in place by oil marketing companies in Nairobi County to curb the downstream supply chain challenges they are experiencing include; use of integrated ICT system (32%), continuity in supply to ensure no shortages in supply (30%), maintain good customer relations (28%), and employing experts and professionals in supply chain management (26%). Other measures that were established include; subsidizing and controlling oil prices (16%), implement proper supply chain management system (12%), adequate stock-taking and inventory (12%), having employee workshops/seminars/training programs on supply chain management (10%) among other measures as shown in the table in a descending order.

In line with these findings, a study by Nginga (2013) also found that the most important determinants of multinational oil firms' investment decisions are the investor security and good infrastructure mainly in the transportation and telecommunication sectors. This concurs with this study findings, which pointed out insecurity and poor infrastructure like roads as major supply chain challenges facing oil marketing companies in Nairobi County.

In their study, Gunaseken and Ngai (2014) stated that an effective supply chain is achieved by an organization through managing and integrating key element of information into their supply chain systems. This supports this study's finding, which showed that installing an effective and integrated supply chain system was one of the measures to curb downstream supply chain challenges. Therefore, to achieve effective supply chain integration in the petroleum industry, companies need to implement an integrated information and supply chain technology, which will ensure that the

companies gain competitive advantage through numerous supply chain dimensions such as quality, cost, flexibility, delivery and profit as noted by Gunaseken and Ngai (2014).

Another measure that was noted by this study that could curb downstream supply chain challenges is creating and building an effective strategic supply chain relationship comprising of suppliers, distributors and consumers/customers. In support of this finding, Stuart (2014) noted that companies should adopt strategic supply chain relationships, which is a long-term relationship between the organization and its suppliers and consumers. Further, Wisner (2012) noted that the strategic supply chain partnerships with suppliers and consumers enable organizations to work more effectively with a few important suppliers and more customers that are loyal who are willing to share responsibility for the success of the products.

As per the study findings, one of the downstream supply chain challenge experienced by oil marketing companies is lack of information sharing. Romano (2011) suggested that level of information sharing is a key component in ensuring effective supply management. According to Romano (2011), information sharing has two aspects: quantity and quality. Both aspects are important for best practices of supply chain management and have been treated as independent constructs in the past studies on supply chain management. Level (quantity aspect) of information sharing refers to the extent to which critical and proprietary information is communicated to one's supply chain partner. Shared information can vary from strategic to tactical in nature and from information about logistics activities to general market and customer information (Mentzer, 2010). Quality of information sharing includes aspects such

as the accuracy, timeliness, adequacy, and credibility of information exchanged (Moberg, 2012).

Conclusion

Oil marketing companies experience a wide range of downstream supply challenges. The major downstream supply chain challenges include; tendering systems, frequent fluctuation of international oil prices, logistics challenges, lack of an integrated process management, inadequate storage capacities, and lack of continuity in supply. These challenges negatively affect performance of oil marketing companies. Some of the major effects include; reduction in company's competitive advantage, lack of cost saving during transportation of products, reduction in flexibility in the supply chain and imbalances in global efficiency and customer responsiveness, poor performance of the companies due to increased government regulations, inadequate storage facilities, and inadequate infrastructure like roads. However, there are measures that oil marketing companies can put in place to curb the downstream supply challenges and their effect on company performance. The main measures include; use of integrated ICT systems, maintaining good supply chain relationships with suppliers and customers, employing experts and professionals to manage supply chain activities, controlling frequent fluctuations in international oil prices, having adequate stock-taking and inventory, and conducting employee training programs on supply chain management.

Since there is a positive and strong relationship between supply chain challenges and performance of oil marketing companies, this study concludes that there is need to emphasize on addressing downstream supply chain challenges experienced by oil marketing companies by doing proper forecasting from the suppliers, management,

distributors, and consumers towards achieving a competitive edge in the petroleum industry.

Recommendations

1. The government in collaboration with all stakeholders in the petroleum industry should revise and design policies and regulations with particular focus on controlled competition among companies in the petroleum industry. In addition, there should be controlled national and international oil prices in a manner that they do not fluctuate frequently.
2. Oil marketing companies should ensure that they have well-designed integrated ICT systems that coordinate all operations within the company. This will ease operations and enhance efficiency
3. Oil marketing companies should design and conduct frequent employee training programs on their operations and how to enhance efficiency. Among the trainings should be trainings on supply chain functions since they cut across all sectors and operations. This will help in curbing downstream supply chain challenges experienced by the oil marketing companies

Recommendations for Further Research

1. The study recommends that further studies on supply chain challenges in the upstream and midstream oil sectors in Kenya. This will establish whether the downstream supply chain challenges and their effect on performance of oil companies are similar to those in the upstream and middle stream sector, and if not, there is need to establish what the major differences are.

2. A further the study recommends that research on other oil marketing companies that are not located in Nairobi County and are not in the petroleum industry. The findings of that study will help in generalizing on the downstream challenges in Kenya rather than Nairobi County alone.

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APPENDICES

Appendix A: List of Oil Marketing Companies in Nairobi

1. OLA ENERGY	29. RANWAY	57. ARECH PETROL
2. KENKOB	30. E.A GASOIL	58. BLUE SKY ENERGY
3. VIVO ENERGY	31. TOSHA	59. BRAIN FIELD OIL
4. TOTAL	32. AXON	60. LINK OIL
5. NOCK	33. OLYMPIC	61. BACHULAL
6. ENGEN	34. AINUSHAMSI	62. ACER PETROL
7. GAPCO	35. FINEJET	63. OIL ENERGY
8. PETRO	36. ONE PETROL	64. AFTAH PETROL
9. DALBIT	37. KENCOR	65. LAKEOIL
10. MOIL	38. TIBA	66. GASLINE
11. TOWBA	39. RAMJI	67. TORCH ENERGY
12. ASPAM ENERGY	40. ILADE	68. EON ENERGY
13. HASS	41. STABEX INT	69. LEXO ENERGY
14. GALANA	42. OCEAN ENERGY	70. FUEL LINK ENERGY
15. ORYXENERGIES	43. EMKAY INT	71. HASMACK COMPANY
16. FOSSIL	44. ASTROL	72. MERIDIAN ENERGY
17. OILCOM	45. KOSMOIL	73. TESLOR CORPORATION
18. GLOBAL	46. SOCIETE PETROL	74. ZACOSIA TRADING
19. MOGAS	47. HELLER	75. FASTNETT ENERGY
20. BE ENERGY	48. TRISTAR	76. BUZEKI ENTERPRISES
21. GULF ENERGY	49. LUQMAN	77. EVON INTERNATIONAL
22. HARED	50. AFRO PETROLEUM	78. OILPRO LIMITED
23. RIVAPET	51. PETROCAM	79. KAYMAN ENERGY
24. ROYAL ENERGY	52. ASHARAMI SYNERGY	80. COSTALINA ENERGY
25. CITYOIL	53. TEXAS ENERGY	81. BILHAN COMPANY
26. BANODA	54. NETGAS	82. VERSEFIELD PETROLEUM
27. REGNOL	55. MSOIL	
28. PACIFIC PETROL	56. BUSHRA ENERGY	83. MADIEAN COMPANY

Source: ERC (2018)

Appendix B: Researcher's Introduction Letter to the Respondents

Dear Respondents;

My name is Purity Maondo currently a Master of Arts student at Daystar University undertaking Monitoring and Evaluation course. I am presently conducting a study on the **Effects of Downstream Supply Chain Challenges on Performance of Companies in Petroleum a Case Study for Nairobi County.**

In this regard, I am asking for your precious time and effort to answer all the questions in the questionnaire that are important and helpful for the completion of the study.

The information you will provide will be used with highest level of confidentiality and for academic purposes only.

Your honest and genuine information that you will provide will be of valuable contribution for the success of the study and will highly be appreciated.

Thank you very much for your cooperation.

Yours sincerely

PURITY JUMWA MAONDO

Appendix C: Researcher's Letter Seeking Permission from the Companies

General information on communication

Purity Jumwa Maondo,
Daystar University

Nairobi.

Dear Sir/Madam

RE: LETTER OF PERMMISSION FROM ORGANIZATION

As part of my work towards fulfilling the requirement for the award of a Master of Arts degree in Monitoring & Evaluation, through Daystar University, I am undertaking a research on **Effects of Downstream Supply Chain Challenges on the Performance of Petroleum Industry in Kenya a case study for Oil Marketing Companies in Nairobi County**. I humbly request for your permission to undertake a study in your Companies for the purpose of completing my research.

The research seeks to administer questionnaires with your employees and conduct in depth interviews with the management team to understand the effects of downstream supply chain challenges on the performance of Oil Marketing Companies in Kenya and how different companies have developed mitigation measures to curb the challenges. The research findings will be used for education purposes as well as to inform Oil Marketing Companies on ways of improving the supply chain of petroleum products in Kenya. Each participant would be a voluntary participant and letters affirming confidentiality and anonymity will be issued. The participants are encouraged to answer the questions frankly during the interviews sessions.

Kind regards,

PURITY JUMWA MAONDO

Appendix D: Questionnaire for Employees

Dear Sir/Madam,

My name is PURITY MAONDO, a Masters Student at Daystar University. I am currently carrying out an academic research project on “The Effect of Downstream Supply Chain Challenges on Performance of Companies in Petroleum Industry in Kenya. Your company was selected to be among those participation in this study. Therefore this questionnaire seeks information on your personal background, downstream supply chain challenges you are experiencing, effects of those challenges on performance of the company, and measures that can be put in place to curb those challenges. I therefore kindly request you to take a few minutes of your time and fill out this questionnaire to help me complete this research successfully. Please be as honest and truthful as possible. Be assured that your responses will be treated with utmost confidentiality and will be used purely for academic purpose only. If you have any questions about this Research or want to know about the results, please feel free to contact me (Purity Maondo) on +254 711 274959 or email jumwakabibi@gmail.com or contact my supervisors at the Department of Development Studies, Daystar University, Kenya.

Instructions

In some questions, choices are provided so please put a **tick** in the appropriate box. Where choices are not provided, answer using your own words in the most appropriate and comprehensive way.

SECTION A: DEMOGRAPHIC DATA

1. Gender: Male [] Female []

2. Your age: 18 - 25 years [] 26 - 35 years [] 36-45 years []
46 - 55 years [] 56 - 65 years [] above 65 years []

3. Education level:
Primary [] Secondary [] Certificate [] Diploma [] Bachelors []
Masters [] PhD [] Professional []

Others: Please specify

4. Position within the organization:

5. Number of years worked at your current position:

Less than a year [] 1 - 5 years [] 6 - 10 years []

11 – 15 years [] 16 – 20 years [] above 10 years []

Section B: Types of downstream supply chain challenges experienced by companies in petroleum industry in Kenya

6. What role does your company play in the petroleum industry?

Supplier [] Distributor [] Management []

Any other role (specify):

7. (i) Does your company experience any downstream supply chain challenges?

Yes [] No []

8. (a) The table below shows some of the common downstream supply chain challenges experienced by companies in petroleum industry. Kindly indicate the extent to which you agree or disagree that your company experience the listed challenges.

SA=Strongly agree, A=Agree, NS=Not sure, D=Disagree, SD=Strongly disagree

Downstream Supply Chain Challenges	5 SA	4 A	3 NS	2 D	1 SD
Tendering systems					
International oil prices					
Logistics					
Integrated process management					

(b) Apart from the challenges listed in the table above, kindly list and explain any other downstream supply chain challenges that are experienced by your company.

- i.
- ii.
- iii.

Section C: Coping with the downstream supply chain challenges

9. How does your company cope with the downstream challenges highlighted in question 8 above?

- i.
- ii.
- iii.
- iv.

v.

10. Section D: Effects of downstream supply chain challenges on performance of companies in petroleum industry

(ii) (a) Kindly indicate the extent to which you agree or disagree to the statements listed in the table below with regard to the effects of downstream supply chain challenges on performance of your company.

SA=Strongly agree, A=Agree, NS=Not sure, D=Disagree, SD=Strongly disagree

Effects downstream supply chain challenges on performance of companies	5 SA	4 A	3 NS	2 D	1 SD
Downstream supply chain challenges affect our company's competitive advantage through price/cost, quality, delivery dependability, time to market, and product innovation					
Ineffective information sharing in our company has led to low levels of supply chain integration thus forcing our company management to make unreliable deliveries and taking long to introduce products to the market.					
Lack of postponement or delay strategy in our company reduces flexibility in the supply chain and imbalances global efficiency and customer responsiveness					
Increased government regulations in the downstream supply chain process have led to ineffective performance of our company					
Lack of cost saving during transportation of the company's products has led to poor performance					
Inadequate storage oil and other petroleum products has led to poor performance of our company					
Inadequate infrastructure like roads has hindered effective performance of oil marketing companies					

(b) Apart from the ones listed in the table above, kindly highlight any other effect of downstream supply chain challenges on performance of your company.

- i.
- ii.
- iii.

Section E: Measures to curb the downstream supply chain challenges experienced by companies in petroleum industry

11. What measures can be put in place to curb the downstream supply chain challenges experienced by oil marketing companies in petroleum industry?

- i.
- ii.
- iii.
- iv.
- v.

Section F: Performance of Oil Marketing Companies

12. (a) Kindly indicate the extent to which you agree or disagree to the statements listed in the table below with regards to the **Performance of your company**.

SA=Strongly agree, A=Agree, NS=Not sure, D=Disagree, SD=Strongly disagree

Performance of Oil Marketing Companies	5 SA	4 A	3 NS	2 D	1 SD
Effective downstream supply chain management has led to increased sales in your company					
Effective downstream supply chain management has enabled our company to have a bigger market share					
There is effective cost and service leadership in our company					

END. THANK YOU FOR YOUR TIME.

Appendix E: Interview Guide for Member of Board of Management

Questions

1. Does your company experience any downstream supply chain challenges?
Yes [] No []
2. What types of downstream supply chain challenges are experienced by your company? Explain.
3. How does your company cope with the downstream supply chain challenges it is experiencing?
4. What are the effects of downstream supply chain challenges on performance of your company?
5. What measures your company has put in place to curb the downstream supply chain challenges experienced?

Appendix F: Ethical Clearance

VERDICT - APPROVAL WITH COMMENTS
Daystar University Ethics Review Board

Our Ref: **DU-ERB/06/02/2020/000396**

Date: 6th February 2020

To: Purity J. Maondo

Dear Purity,

RE: EFFECTS OF DOWNSTREAM SUPPLY CHAIN CHALLENGES ON THE PERFORMANCE OF PETROLEUM INDUSTRY IN KENYA: A CASE OF SELECTED OIL MARKETING COMPANIES IN NAIROBI COUNTY.

Reference is made to your ERB application reference no. 220120-01 dated 22nd January 2020 in which you requested for ethical approval of your proposal by Daystar University Ethics Review Board.

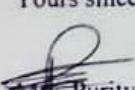
We are pleased to inform you that ethical review has been done and the verdict is to revise to the satisfaction of your Supervisors and Head of Department before proceeding to the next stage. As guidance, ensure that the attached comments are addressed. Please be advised that it is an offence to proceed to collect data without addressing the concerns of Ethics Review board. Your application approval number is **DU-ERB-000396**. The approval period for the research is between **6th February 2020 to 5th February 2021** after which the ethical approval lapses. Should you wish to continue with the research after the lapse you will be required to apply for an extension from DU-ERB at half the review charges.

This approval is subject to compliance with the following requirements:

- i. Only approved documents including (informed consents, study instruments, MTA) will be used.
- ii. All changes including (amendments, deviations, and violations) are submitted for review and approval by Daystar University Ethics Review Board.
- iii. Death and life threatening problems and serious adverse events or unexpected adverse events whether related or unrelated to the study must be reported to Daystar University Ethics Review Board within 72 hours of notification.
- iv. Any changes, anticipated or otherwise that may increase the risks or affected safety or welfare of study participants and others or affect the integrity of the research must be reported to Daystar University Ethics Review Board within 72 hours.
- v. Clearance for export of biological specimens must be obtained from relevant institutions.
- vi. Submission of a request for renewal of approval at least 60 days prior to expiry of the approval period. Attach a comprehensive progress report to support the renewal.
- vii. Submission of a signed one page executive summary report and a closure report within 90 days upon completion of the study to Daystar University Ethics Review Board via email [duerb@daystar.ac.ke].

Prior to commencing your study, you will be expected to obtain a research license from National Commission for Science, Technology and Innovation (NACOSTI) <https://oris.nacosti.go.ke> and other clearances needed.

Yours sincerely,


Mrs. Purity Kiambi,
Secretary, Daystar University Ethics Review Board

Encl. Review Report

"...until the day dawn and the daystar arise in your hearts"
 2 Peter 1.19 KJV

Appendix G: Approval Letter from Daystar University

10th February 2020

National Commission for Science, Technology and Innovation
P. O. Box 30623-00100
Nairobi
KENYA

Dear Sir/Madam,

RE: PURITY J. MAONDO (16-1677)

The above named is a student in the Master of Arts, Monitoring and Evaluation program at Daystar University Nairobi Campus. She is about to complete her coursework for the Master's program, and is required to do research as part of her final requirements.

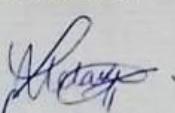
The topic of study is '*Effects of downstream supply chain challenges on the performance of petroleum industry in Kenya: A case of selected oil marketing companies in Nairobi County*'. Her proposal has been passed and approved by the Department of Development Studies and the Daystar University Ethics Review Board.

She is hereby authorized by the University to carry out her study by collecting data from the field. She requires your authorization to facilitate the same.

Thank you in advance for your willing to give this opportunity. We are truly grateful for your partnership in this, and for your organization's contribution in the education of Daystar University students.

If you have any queries, please do not hesitate to contact me.

Yours faithfully,


Dr. Philemon Yugi
HOD, DEVELOPMENT STUDIES

Ref:hd/nacosti

"... until the day dawn and the daystar arise in your hearts"
2 Peter 1:19 KJV

Appendix H: Research Permit

 <p>REPUBLIC OF KENYA</p> <p>Ref No: 554043</p> <p>RESEARCH LICENSE</p>  <p>This is to Certify that Ms.. Purity Jumwa Maondo of Daystar University, has been licensed to conduct research in Nairobi on the topic: EFFECTS OF DOWNSTREAM SUPPLY CHAIN CHALLENGES ON THE PERFORMANCE OF PETROLEUM INDUSTRY IN KENYA: A CASE OF SELECTED OIL MARKETING COMPANIES IN NAIROBI COUNTY for the period ending : 16/March/2021.</p> <p>License No: NACOSTI/P/20/3943</p> <p>Applicant Identification Number</p> <p>NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.</p>	 <p>NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION</p> <p>Date of Issue: 16/March/2020</p> <p>Director General <i>[Signature]</i></p> <p>Verification QR Code</p> 
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Appendix I: Plagiarism Report

Purity Maondo thesis - 01.11.2020

ORIGINALITY REPORT

13%	12%	3%	7%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

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