# RELATIONSHIP BETWEEN SUPPLY CHAIN PERFORMANCE AND PERFORMANCE OF STATE OWNED FIRMS IN THE ENERGY SECTOR IN KENYA

BY

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# DECLARATION

This masters project is my unique and original work that has not been submitted for examination to any other university body.

SIGN: ------------------------------ DATE: -------------------------------

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**ADMISSION NUMBER: D61/84324/2016**

This masters project has been submitted for examination with my endorsement as a University Supervisor.

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# DEDICATION

This research is dedicated or committed to my parents for showing me that hard-work is the only way out, failing is not an option and education is not a compromise. The strict life principles you instilled in me over the years gave me the self-discipline I needed to complete this proposal.

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# ABBREVIATIONS AND ACRONYMS

**SPSS:**        Statistical Package for Social Sciences

**ANOVA:**    Analysis of Variance

**KPI:**          Key Performance Indicators

**OEE:**         Overall Equipment Effectiveness

**EDLP:**      Everyday Low Pricing

**HLP:**          High and Low Pricing

**PM:**           Performance Measurement

**BSC:**         Balance Score Card

# ABSTRACT

The role of supply chain performance in the success of a firm cannot be exaggerated since it affects strategic, tactical and operational planning and control. This study explored the relationship between supply chain performance and performance of firms in the state owned energy sector. A descriptive study design was adopted. The research was guided by the following goals; to establish the relationship between supply chain performance and performance of firms in the Kenyan state owned energy sector. This study took the form of a census of all the state owned firms in the Kenyan energy sector. A total of 84 questionnaires were administered to purposively selected respondents consisting senior managers and procurement officers. Survey responses were entered into SPSS version 22 for initial descriptive data analysis. Multiple linear regression analysis was used to establish the relationship between supply chain performance and performance of firms of firms in the state owned energy sector in Kenya. The outcome of the multiple linear regression analysis suggest that transport management, order processing management, logistic information system and inventory management significantly predicts firms' performance ($p<0.05$) respectively. The model shows that unit increase each of the predictor variables increases the performance of firms by a positive unit of the value of the respective factors. Order processing management was the predictor variable which increases performance of firms by higher value (0.497), followed by transport management (0.487), inventory management (0.428) and logistic information system (0.327). In overall, supply chain performance was found to have an important positive connection or relationship with performance of state owned firms in the energy sector in Kenya. Therefore supply chain performance needs integrated at all levels of the firms' operations while taking into account transport management, order processing management, logistic information system and inventory management since this will go far in improving the overall performance of the firm.

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# CHAPTER ONE: INTRODUCTION

## 1.1 Background of the Study

Supply chain performance is a major component of a competitive strategy that enhances firms' productivity and profitability (Ayuso, 2006).The concept of supply chain encompasses people, activities, organizations, resources and information used in moving a product or service from supplier to customer (Sacconi, 2010). In particular, the activities of supply chain transform raw materials and natural resources into finished products. However, where residual value is recyclable, used products may also re-enter the supply chain in sophisticated supply chain systems (Tummala et al., 2006). Given that performance metrics supports effectiveness, firms ought to eliminate functional silos and multifunctional teams that are results oriented (Han et al, 2010).

The current study is underpinned by two theories; contract theory and value chain theory. In particular, the contract theory explores the construction of legally binding courses of action, particularly in the presence of asymmetric information. One conspicuous use of it is the outline of ideal plans of administrative remuneration (Laffont, 2012). The spirit of contract theory lies in discovering approaches to persuade operators to take proper activities under supply chain contracts. The value chain theory is anchored on five principle stages in the value chain that creates ability of the firms to develop a value beyond the cost of production. These five principles involve; inbound logistics, operations, outbound logistics, marketing and sales, and service. Therefore, maximizing these set of activities impacts on firms performance. In particular, the theory of value chain focuses on a precise approach of looking at all supply chain exercises of a firm and the interaction of these activities that forms the basis of analyzing companies' sources of competitive advantage (Wachs, 2013).

## 1.1.1  Supply Chain Performance

Supply chain performance alludes to extended supply chain's activities in meeting end-customer requirements, including product availability, on-time delivery, and all the

necessary inventory and capacity in the supply chain to deliver that performance in a responsive way (Atkinson, 2003). Supply chain performance crosses organization limits or boundaries since it incorporates essential materials, components, sub-assemblies and finished products, and distribution through various channels to the end client (Han, Wilson &Dant, 2010). It additionally crosses traditional functional organization lines for example supply chain, manufacturing, distribution, marketing & sales, and research and development (Sacconi, 2010). The role of supply chain performance in the success or achievement of an organization cannot be exaggerated because it affects strategic, tactical and operational planning and control (Han et al, 2010).

Supply chain performance measures can be broadly classified into two main categories. These categories include qualitative and quantitative measures. Qualitative measures refers to customer loyalty or satisfaction and product quality while and quantitative measures refers to order-to-delivery lead time, supply chain response time, flexibility, resource utilization, and delivery performance. In the current study the investigator concentrated just on the quantitative performance/execution measures. Conceptually, enhancing supply chain performance requires a multi-dimensional technique that addresses how the firm will benefit or service diverse customer needs. While the performance measurements might be comparable, the specific performance objectives of each segment might be very unique, (Atkinson, 2003).

Supply chain performance in the Kenyan energy sector still remains fairly under examined. For example Forslund (2007) noted that in the Kenyan energy sector, state owned firms' comprehension of their supply chain is still in its early stages and needs much change. Nonetheless, the national energy demand is increasing. This alongside the increasing management constraints makes it hard to ensure feasible national energy supply (Fullerton and Wempe, 2000). Additionally, energy products need specific methods of transport. Thus costly and complex logistics and lengthy or protracted lead-times have been normally related to the operations of firms in the energy sector. For such reasons, firms in the energy sector have been compelled to restructure or rebuild their procedures, protect higher safety stock, and recognize elective sourcing supplies among

numerous different exercises (Francisco *et al.*, 2003).The supply chain of firms in the energy sector is much more complex in comparison to other sectors. Hence the current study established the relationship between supply chain performance and performance of firms in the energy sector in Kenya.

### 1.1.2 Firms' Performance

Firms' performance is defined as the assessment of success or accomplishment of the company target (Zachary and Henry, 2012). Performance is considered as a administration or management apparatus that accomplishes solid objectives (Lebas, 1995). Contemporary ways to performance measurement include the intangible dimensions, for example public image and perception, customer satisfaction, employee satisfaction and attrition, skills levels, innovations in products and services investments into training and new esteem streams et cetera (Forslund 2007; Francisco *et al.*, 2003; Fullerton and Wempe, 2000).

There are diverse approaches of performance measurement frameworks or systems that can be applicable to state owned state owned energy sector supply chains. Some of the common performance measurements strategies include the balanced scorecard, SCOR model and benchmarking (Handfield*et.al.*, 2009). The Balanced Scorecard (BSC) approach to performance measurement was developed by Kaplan and Norton (1992-1996) as an approach to adjust organizational performance measures with its vital plans and objectives (Fawcett *et.al.*, 2007 Wisner *et.al.,* 2008). The SCOR model is used as a supply chain management diagnostic, benchmarking and process improvement tool by manufacturing and service firms in a variety of industries around the world over (Wisner *et.al.*, 2008). While financial performance is considered to be a famous instrument for the assessment of the firm's financial situation, health, revenue and profit making, and possible long term survival in the foreign markets, non-financial indicators supplement the financial indicators and highlight the difference between performance of state owned firms and performance of subsidiaries as a service (Domanovice and Bogicevic, 2009). In the current study, the investigator will concentrate on adopting a balanced way or

approach to performance measurement and the need for using leading and lagging indicators in a coordinated way.

### 1.1.3  Supply Chain Performance and Firms Performance

Successful supply chain performance contribute or add to the key assessment of procurement decisions, primarily in terms of the advancement and pursuit of competitive methodologies, "make – versus- buy" decisions, and the choice between market and relational forms of exchange (Han et al, 2010). These choices are vital to the advancement of a specific type of buyer- seller relationship within supply chain (Parsons, 2011). Obtaining of human- specific assets, when acquisition of information on processes and other forms of supply chain knowledge is desired, firms may integrate or coordinate reverse into supply, or form strategic alliances. Given that information so desired may regularly dwell inside personnel rather than as blue-prints, integration into supply results not only in the ownership of physical assets of the acquired firm but also in the acquisition of knowledge possessed by the acquired firms' workers (Pope, 2010).

The prime stage of supply chain performance is characterized by a fundamental, end-to end transformation of the supply chain. Organizations now focus on high-quality, cost-effective, profitable supply chain performance, not mere compliance. They also identify and exploit value creation through economies of scale and innovative operating models. At this stage, the supply chain is incorporated into the organization's business strategies. Traditional silos of processes and knowledge are broken down, and both staff and supply managers can collaborate across functions to support the efficiency metrics are broader in scope but are not linked to financial key performance indicators (KPIs) or the strategic objectives of the organization. Effectiveness metrics represent a quantum leap in integration, visibility and alignment with overall supply chain performance. In the effective stage, the focus shifts from discrete functions to integrated processes. Metrics are multidimensional and span the entire supply chain, including others across the supply chain, (Han et al, 2010).

### 1.1.4  Kenyan State owned energy sector

The Kenyan state owned energy sector is largely dominated by petroleum and electricity (Sacconi, 2010). Electricity or power access in Kenya is low in spite of the administration's aggressive focus to expand power availability from the current 15% to no less than 65% by the year 2022 (Han et al, 2010). In Kenya, the current effective installed power limit or capacity is 1,533 MW. Specifically, power supply is transcendently sourced from hydro and non-renewable energy source (warm) sources. Just until recently the country lacked significant domestic reserves of fossil fuel. The nation has throughout the years needed to import considerable measures of raw petroleum and flammable gas. Kenya has an installed limit or capacity of 214 GW. Whilst about 57% is hydro power, about 32% is thermal and the rest comprises geothermal and emergency thermal power. Solar PV and Wind power play a minor role contributing less than 1%. However, hydropower has ranged from 38-76% of the generation mix due to poor rainfall. Thermal energy sources have been utilized to compensate for these deficits, shifting between 16-33% of the mix (Han, Wilson & Dant, 2010).

State owned firms in the Kenyan energy sector comprises of KPLC, KENGEN, ERB, MOE, Geothermal. Particularly, forty eight percent of KPLC is owned by the government. KPLC is the main approved open power disperse and transmitter. Be that as it may, the generation of power in Kenya has a few players, boss among them being the state-possessed KENGEN, and three IPPs. KPLC has control buy contracts with KENGEN. KENGEN represents more than 82 percent of the nation's aggregate introduced age limit, (Atkinson, 2003). Kenya Electricity Generating Company oversees and builds up all open power creating offices. It pitches power in mass to Kenya Power. Kenya has a Renewable Energy Portal that gives simple access to pertinent data about managerial passage necessities and methodology for working a power plant in view of sustainable power source, the legitimate and administrative system for such speculations, for example, tax control and important market data. Thus, the Energy Regulatory Commission (ERC) audits power levies and implements wellbeing and natural controls in the power area and also shielding the interests of power customers (Han *et al.* 2010).

## 1.2 The Research Problem

Supply chain performance has been portrayed by scholars as an important predictor of performance of most of the state owned firms in the state owned energy sector in Kenya. However, a few studies have directly or indirectly seconded this perception (Boyd et al, 2012: Jasper, 2015). Overall, supply chain performance is perceived as antecedent to performance of the state owned firms in the state owned energy sector. Most studies have suggested a noteworthy positive relationship between supply chain performance and performance of firms in the state owned state owned energy sector (Boyd et al, 2012: Jasper, 2015: Robert and Linah, 2015: Henrik, 2016). Others have recommended that a negative affiliation exists between supply chain performance and of firms' performance (Kilantaridis &Levanti, 2000; Poof & Heriot, 2005). Yet others have proposed that no relationship exists between supply chain performance and performance of state owned firms in the energy sector (Amato and Wilder, 1985).

Kenya has pondered the test of inconsistent, costly and unsustainable energy utilize supporting a stagnating industrial and manufacturing base (Han, Wilson & Dant,2010). In the meantime the nation has as of late made some appreciated revelations as coal, oil and gas deposits that could fundamentally change the structure of the economy, with real contributions to public revenue and effect on other financial segments. This represents an exceptional test to strategy or policy maker and to the individuals who use energy resources to re-assess their operations and look for more prominent efficiencies in order to lessen costs (Parsons, 2011). One of the significant areas that have been distinguished as having the capacity to enhance efficiencies and lessen costs is in the supply chain performance (Sacconi, 2010). Burgress*et.al* (2006) noticed that supply chain performance has turned out to be critical yet there seems, by all accounts, to be little research that is centered on supply chain performance & firms' performance in the state owned state owned energy sector in Kenya.

Contextually, in 2003, the Kenyan government initiated the implementation of reforms to mitigate the inefficiency in the utilization of public resources and weak institutions of governance especially in the state owned firms in the state owned energy sector (Sacconi,

2010). Particularly, these reforms included the establishment of anti-corruption strategies to enhance the fight against corruption and the enactment of the Public Supply chain and Disposal Act 2005 which focuses mainly in making the public supply chain process more transparent, ensuring accountability, and reducing wastage of public resources in the supply chain department of the state owned energy sector (Parsons, 2011). The investigator chose the state owned energy sector because it is more prone to supply chain challenges and the study will offer probable solutions to the looming challenges.

Various investigations on supply chain performance had been conducted. Onyango (2011) examined supply chain administration or management practices and performance in cement industry in Kenya. He attributes inadequate supply chain performance in the cement industry to ineffective collaboration during planning, lack of understanding or comprehension of the supply chain management performance concept. The study also established that there were strategic relationships with suppliers and customers within the cement industry but did not reveal about long term relationships between suppliers and clients. Odhiambo and Kamau (2005) point that the bulk of corrupt practices in Kenya have occurred in public supply chain are associated with opaque and unaccountable regulations. Some of the corrupt individuals include the supply chain officers that are influenced by self-interests and by external forces.

The investigator chose the energy sector because it is more prone to supply chain challenges and the study will offer probable solutions to the looming challenges. The current study sought to fill in the research gap on supply chain performance and firms' performance in the energy sector by establishing the link between supply chain performance and firm performance in the Kenyan energy sector. As such, the study sought to answer the following research question; what is the relationship between supply chain performance and performance of state owned firms in the Kenyan energy sector?

## 1.3 Objective of the study

To establish the relationship between supply chain performance and performance of state owned firms in the Kenyan energy sector.

## 1.4 Value of the Study

The study is expected to be useful to various parties, and especially the following: First this study shall be very significant to the academicians and researchers of all institutions in both Kenya. The research findings are expected to contribute to a better understanding of supply chain performance of Kenyan energy sector. In so doing, they can contribute to the available body of theory and knowledge. The existing management in various firms in the Kenyan energy sector, in pursuit of their organizational goals and objectives also benefit by the knowledge of how they can harness their autonomy into their leadership styles, which led to good governance, improved creativity and innovativeness, and eventually improved performance. Finally; Policy Makers in Kenya can improve the policy making capacity and also apply innovation in policy implementation in areas of training and capacity building and performance management.

# CHAPTER TWO: LITERATURE REVIEW

## 2.1 Introduction

This chapter concentrates on viewing significant literature on the concepts of supply chain and performance of firms in the state owned energy sector. This section is organized in the following parts: First, a review of relevant theories earlier introduced will be conducted. Secondly, a highlight of what other scholars have said on the topic of study will follow. Third, a blend of the scholars' views will be done so as to provide the existing knowledge gaps on the topic of study. Fourth, the conceptual framework and hypotheses will be developed which will guide the data collection, analysis and discussions.

## 2.2 Theoretical Foundation

The foundation of any theory sets beginning premises which shapes the reasons for the logical developments of propositions concerning the structure, conduct, execution, and the presence of business entities. A number of theories have been used to uncover the impact of supply chain performance to an organization performance. As a result, the study will be hinged on two key theories; these contract theory and value chain theory.

### 2.2.1 The Contract Theory

The contract theory focuses on the supply chain of contractual arrangements using asymmetric information. In particular, the contractual theory is embedded on optimal schemes of managerial compensation (Laffont & Mrtimort, 2012). In practice, specific utility structures are used to represent the behavior of the decision maker in the contract theory. This is followed by application of an optimization algorithm which is used to identify optimal decision (Parsons, 2011). The fundamentals of contact theory can be alluded to moral hazard, adverse selection and signaling. The contact theory model focuses on establishing theoretical domains to motivate operators to take the most proper activities even under insurance contracts.

The contract theory represents the behavior of the decision maker based on specific numerical utility structures and use of optimization algorithm in making important

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decisions. This process has been employed in the contract theory model to several typical contexts namely good peril, unfavorable choice and flagging. The motive of this theoretical framework is to motivate agents to undertake appropriate measures under insurance contract.

The major outcomes of the family models include scientific properties of the utility structure of the principle and the specialist unwinding of presumptions, and variations of the time structure of the contract or agreement relationship. The contract theory is underpinned by the premise that the incentive contract is somewhat freely enforceable. In particular, the accountability for the delivery of contracted services lies solely on the contractor. Ideally, this is not always the case. As such, to major issues are normally involved (accountability and enforceability). In this regard, enforcement of contracts in timely situation by firms has proved futile in such extreme situations. In addition, the firms may also be unable to hold the contractors accountable in such extreme situations. In particular the standard contracting procedure envisages that risk premiums should be incorporated to the contract in situations where the contactor is required to bear risk. Nonetheless in the situations where the risk is somewhat extreme then the risk premium by not be sufficiently high to cover this particular risk (Wenz, 2011).

## 2.2.2 Value Chain Theory

The theory of value chain depicts an efficient approach of inspecting all supply chain functions of a firm and the interaction of these activities that forms the basis of analyzing companies' sources of competitive advantage. In particular, each link in the value chain system comprises a bundle of activities that are also referred to as value of activities. These value of activities are performed by the company to produce, design, deliver market and support its goods. Notably, the theory of value chain alludes that the value of activities are the discrete building block of a firms' performance. As such supply chain managers must focus on the way in which value chain operations in the tangible world of the marketplace as well as the virtual world of the market space (Boyd et al, 2012).

The theory of value chain envisages five principle stages in the value chain that creates ability of the firms to develop a value beyond the cost of production. These five

principles involve; inbound logistics, operations, outbound logistics, marketing and sales, and service. As such, maximizing these set of activities impacts on firms performance (Niven, 2002). In particular, inbound logistics involves inventory control, warehousing and receiving, warehousing and inventory control. Operations involve the value-creating activities that are imperative in the transformation of inputs into final products. Outbound logistics primarily involves all activities necessary for the customers to get a finished product. Sales and marketing involves all activities related to mobilization of customers to purchase the finished product. Service activities are aimed at maintaining the products value while providing customer support. In sum, a firms output undergo through the value chain of distributors until they reach the targeted customers. To achieve a sustainable performance in the industry, firms must consider every component of the value chain system beyond any reasonable doubts (Jasper, 2015: Robert and Linah, 2015: Henrik, 2016).

## 2.3 Supply Chain Measure

Supply chain performance is crucial to all stakeholders in the logistics system since it generates added value to the customer and improve global and local optima. The energy sector is characterized by unique processes and workflows (Zhao et al., 2008). Therefore, examining the overall supply chain performance is somewhat a complex task. Nonetheless measuring the overall supply chain performance can be narrowed down to a few key constructs. The constructs involves; establishing whether the supply chain is acquiring the things needed by the firm; whether the firm is providing the customers with the things they need and whether the firm is providing the thing needed by the customers at the right time and in the right place (Wu et al., 2010). In this regard, the current study employed four key supply chain performance indicators to measure the overall supply chain performance of state owned firms in the Kenyan energy sector. The indicators included; transport management; inventory management; order process management and logistic information system as discussed in the subsequent paragraphs.

## 2.3.1 Transport Management System

Transport management is an important supply chain component that requires a dedicated attention to keep track of. This is because it stands for about 60% of the of the total supply chain cost together with cost of inventory (Ahumada & Villalobos, 2004). In particular, transportation plays various roles in supply chain. These roles involves; providing a link between production, storage and subsequent consumption (Kasilingam, 1998). The success of the supply chain relies upon a good execution of transportation (Tracey, 2004).

According to a study by Villalobos (2004), the cost of transportation occupies a significant amount of supply chain cost and influences supply chain performance. As such, supply chain managers need to consider several decisions regarding transportation such as information support systems, the design of the physical network, the transportation cost, service negotiations and mode and carrier assignment (Tracey, 2004). The network design requires considering whether there is a need for the shipment from the provider to be specifically transported to the point of interest or transportation through one or few solidification focuses first. With regards to the transport modes, supply chain managers should decide on the type of mode to use based on the firms' supply chain methodology or strategy. A firm can pick between various modes of transports ranging from truck, rail, sea, pipeline and air. In particular, all modes have different features with regards to cost of delivery, space, adaptability and speed (Chopra & Meindl, 2013). For instance, while transporting product by air might a costly option which might lead to increase in the cost of transportation. Nonetheless it provides for faster transportation to potential customers and results in a greater degree of responsiveness and ultimate customer satisfaction (Kahn & Easton, 2002).

A study conducted by Otieno (2008) found that efficient transport management system is positively associated with improved supply chain efficiency, minimized operation cost and improved service quality of firms. According to Tracey (2004), transportation can be classified in to two categories; inbound and outbound transportation. In particular, inbound transportation connects the firm to its suppliers or providers and can be viewed

as essential aspects since it impacts on the execution of other function that involves production and distribution. In bound transportation ensures provision of the right material at the right time and at the right location. Inbound transportation is a significant parameter to keep track of since it represents 10% of the aggregate material cost (Tracey, 2004). Delivery of undamaged goods in real time with correct and timely information depicts the quality of output from an inbound transportation. High product quality and lower cost of production is associated with an increasing inbound transportation performance (Tracey, 2004).

## 2.3.2 Inventory Management

The supply chain performance of any firm is driven by inventory management. In particular, most firms have inventory management tied to their daily operations. (Müller, 2011).The existence of inventory in different companies can be described in terms of different types (cycle and safety inventory) and at different locations (operational supplies, raw materials, work in progress and finished products). In particular, raw materials are the products got from providers. These products are utilized to make parts or finished items (Jasper, 2015).

A study conducted by Melo et al. (2009) found that the key to effective supply chain performance is rested on efficient inventory management system. In particular Melo et al. (2009) found out that an efficient inventory management system is based on five key constructs. These constructs include; segmentation of customers; profitability of products; integration of transport; competitive and time based performance. As such, the ability of a firm to deliver to meet the customers' inventory needs was deemed as a major competitive factor.

Different types of inventories have been mentioned by many researchers, nonetheless this study focuses two types of inventory namely; cycle inventory and safety inventory. According to Hugos (2011), cycle inventory refers to total sum of stock necessary to satisfy the demand for a specific part or item between two purchasing occasions. In most instances, purchasing managers tend to prefer ordering large amount of products or goods

in order to gain the advantage of the economies of scale, nonetheless previous studies conducted Law (2009) suggests a significant association between ordering large amount of goods and high handling costs. As such supply chain managers need to determine whether the merchandise ought to be acquired once in bigger amounts or several times in small quantities as envisaged in the time window.

The second type of inventory is referred to as safety inventory or buffer inventory. The main role of safety or buffer inventory is compensating for supply and demand vulnerabilities (Muller, 2011). Safety inventory additionally decouples diverse operations from each other in order to make them operate independently (uncoupling inventory). Having this safety inventory might be attributed to expanded assembling adaptability (Law, 2009). Supply chain managers should decide regarding whether to prioritize having some additional stock as well as the cost that it acquires, or having fewer inventories and maybe confronting the risk of being out of inventory and subsequently losing potential deals or sales (Hugos, 2011).

### 2.3.3 Order Process Management

Order processing management refers to all activities associated with ensuring that customer orders of goods or services are fulfilled in a reliable manner (Wu et al., 2013). In particular, order processing management forms the foundation of information flow in a supply chain system. Order processing management enhances supply chain performance by creating a flow of information that precede products and accompany them. Order processing is an aspect of supply chain that concerns all activities required for the product to reach the potential consumer form the target supplier and involves building the best supplier strategy for a specific (Ahumada & Villalobos, 2004).

A study by Van-Weele (2005) found out that order processing system forms a communication network that provides essential information for efficient management of the link or connect between supply chain and other areas of the firm and within supply chain. Order processing commences with the acceptance of the order by the firm and

remains incomplete until all the order is received by the customer in a reliable and timely manner.

Effective order processing management relies on a successful work balancing and enhanced information exchange. As such, accurate and quick processing of orders contributes to efficient flow of goods. Firms should focus on efficient processing and regularly evaluate its order processing systems based on indicators that are capable of tracking flexibility, reliability and timeliness of handling orders (Kumar, 2014)

## 2.3.4 Logistics Information Management

Information sharing among units in supply chain is vital. Most companies focus on coordination and cooperation to increase customer demand uncertainty and most organizations broaden their coordination and participation keeping in mind the end goal to better having the capacity to take care of increments in client demand vulnerability. Nonetheless Fawcett et al. (2007) postulate that most firms tend to focus on the technology needed. Technology system that is advanced and costly does not necessarily mean that the two firms will be able to connect to each other since there is much greater need for firms to focus on behavioral changes as to attitude of offering information to different firms in which the use of technology becomes atypical tool for realizing in the information sharing as opposed to the actual sharing of information itself (Fawcett et al., 2007).

A study conducted by Wu et al. (2013) found out that information sharing, quality of information and the amount of information has a significant impact on the productivity of collaboration. Notably, the ability to share information that is sensitive is somewhat vital to the success of the cooperation (Prajogo & Olhager, 2012). Integration of the aspect of information sharing Information sharing in the supply chain system is crucial for forecasting and planning in particular, all firms require forecasting and planning, whereas collaboration is fundamentally important to the success of supply chain (Helms et al., 2000). In particular, effective collaboration relies on sharing accurate and detailed information at the right time (Ahumada & Villalobos, 2004). Difficulties during planning

and forecasting can created by the high demand uncertainty, these difficulties are sometimes linked to the phenomenon alluded to as the Bullwhip impact (Holweget al., 2005). It has been suggested that information sharing may contributes to lowering the demand vulnerability and creating a higher level of trust among the stakeholders in a supply chain (Kumar, 2014).

## 2.4 Firms' Performance Measure

Firms performance is an estimation of how well an established mechanism or process of firm's operation achieve its intended purpose (Moullin, 2003). In particular, performance measurement as a concept is multi-dimensional. The two utmost fundamental dimensions of a firm's performance are effectiveness and efficiency. Adams et al. (2002) postulates that effectiveness measures the degree to which the requirements of the stakeholders are met while efficiency measures the economical utilization of the firm's resources while focusing on the satisfaction of the stakeholder. In order to achieve a good performance, firm must attain its set objectives with a greater efficiency and effectiveness as compared to its competitors (Neely 1998). In the late 1980s, scholars developed various holistic performance measurement frameworks. These frameworks focus on multi-dimensional approach that tends to balance financial and non-financial measures. Other than this model, other performance measurement theories have been applied in practice. The current study focuses on the Balance Score Card (BSC). The Balanced Scorecard suggests that managers should The Balanced Scorecard suggests that managers should view organization's performance from form financial perspective, customer perspective, internal business process and learning and growth perspective.(Parsons, 2011). Based on the premise of the BSC model, the current study identified three key constructs that were used to measure supply chain performance of firms. These constructs include; market share, firms profit and customer satisfaction as discussed in the subsequent paragraphs

## 2.4.1 Firms' Profit

Firms profit focuses on financial data that are instrumental in computing the readily available measurements of economic consequences of the firm's previous actions. In particular, measuring the firm's financial performance is indicative of whether the firms

strategy, usage and execution impacts on the primary concern change. The financial goals relate to the firm's profitability, operating income, return on capital and financial esteem included (Stwart and Mohamed, 2001; Wiersma, 2009; Kaplan and Norton, 1992).

## 2.4.2 Customer Satisfaction

The ultimate objective of any firm is to satisfy its customer since the customers are the primary source of the firm's profit. With this perspective, supply chain managers need to establish the expected target clients and fragments of the market for operational units. Consequently, the firms are expected to screen the execution of operational units in these objective sections (Niven, 2002; Robert et al., 1996; Sohn et al., 2003).

## 2.4.3 Market Share

Market share refers the percentage of a market. Increase in market share is considered as a very crucial indicator of performance by firms. Market share as indicator of firm's performance is less dependet on macro-environment viable such as the state of the economy. The Increasing market share is one of the most important objectives of business (Wiersma, 2009). The fundamental preferred standpoint of utilizing piece of the overall industry as a measure of business execution is that it is less dependent upon substantial scale biological variables, for instance, the state of the economy. Market share is said to be a key marker of market force that is, the means by which well a firm is getting along against its adversaries (Sohn et al., 2003)

## 2.5 The Concept of Supply Chain Performance and Firms' Performance

Optimizing supply chain performance is imperative in supporting a firms' profitability objective. All things considered, firms ought to constantly enhance their execution markers and increment their compliances (Greasley, 2008). Nell (1998) identifies the most crucial operational metricise (customer service and responsiveness). Serving customers with greater reliability and responsiveness is important to firms' success since most customers have always been demanding and more sensitive on what they want. (Neely, 1998).  A study conducted by Cohen and Roussel (2005) suggest other operational metrics associated with financial performance. These involve; utilization of

asset, quality of products and flexibility of operations (Cohen and Roussel, 2005). Asset utilization focuses on estimating the effective of asset utilization and its ultimate impact on firm's financial performance (Tracey, 2004). product quality is also important to a farms' long term survival and growth, since evidence suggest that it is directly associated with financial performance (Huang et al., 2013). Lastly, operational flexibility estimates a firms' agility to cope with the uncertainties and hence focus on improving the firm's ability to succeed financial a highly-uncertain and competitive environment (Bernon et al, 2013).

Supply chain performance has been viewed as an operational function. In particular, the concept of supply chain is currently more strategic to firms' characterized with the trend of globalization and the growth of information technology (Cheong et al, 2011; Miles et al 1994). In the 1990s, supply chain performance shifted from a logistics-focus dealing primarily with warehousing, inventory, and transportation management to an integrated approach that focuses on the management of products flows and proceeds from raw material suppliers to consumers and end product users (Manzoor, 2014).The strategic role of supply chain performance is manifested in its stronger influence on firms' operational and financial performance (Tracey, 2004). The current study seek to find such evidence by surveying firms in the Kenyan energy sector

## 2.6 Conceptual Model

Theoretical system is a plan of factors which the examination operationalizes keeping in mind the end goal to accomplish the set destinations. A conceptual model explains the study variables and the presumed relationships among them (Miles *et al*, 1994). It also represents a synthesized and integrated way of understanding of issues which enables the researcher to address the research problem (Liehr*et al*, 1999). The conceptual framework for this study was formulated after a review of literature and empirical studies revealed some knowledge gaps. Based on the identified gaps, it was necessary develop researcher's own assumptions of the relationships among the study variables. These assumptions were used to formulate the research questions, research objectives, research hypotheses and conceptual framework**.** This is illustrated in figure 2.1. The independent

variable in this context is supply chain performance while the dependent variable is the firms' performance

**Figure 2.1: Conceptual Framework**

| Independent Variable | Dependent Variable |
|---|---|
| **Supply Chain Performance** | **Firms' overall** |

```
┌─────────────────────────────┐              ┌─────────────────────────────┐
│                             │              │                             │
│  ┌───────────────────────┐  │              │                             │
│  │ Transportation        │──┼──────┐       │  ┌───────────────────────┐  │
│  │ management            │  │      │       │  │ Market share          │  │
│  └───────────────────────┘  │      │       │  └───────────────────────┘  │
│                             │      │       │                             │
│  ┌───────────────────────┐  │      │       │                             │
│  │ Inventory Management  │──┼──────┤       │  ┌───────────────────────┐  │
│  └───────────────────────┘  │      ├────── │  │ Firm's profit         │  │
│                             │      │       │  └───────────────────────┘  │
│  ┌───────────────────────┐  │      │       │                             │
│  │ Order Process Mgmt    │──┼──────┤       │  ┌───────────────────────┐  │
│  └───────────────────────┘  │      │       │  │ Customer satisfaction │  │
│                             │      │       │  └───────────────────────┘  │
│  ┌───────────────────────┐  │      │       │                             │
│  │ Logistic Information  │──┼──────┘       │                             │
│  │ management            │  │              │                             │
│  └───────────────────────┘  │              │                             │
└─────────────────────────────┘              └─────────────────────────────┘
```
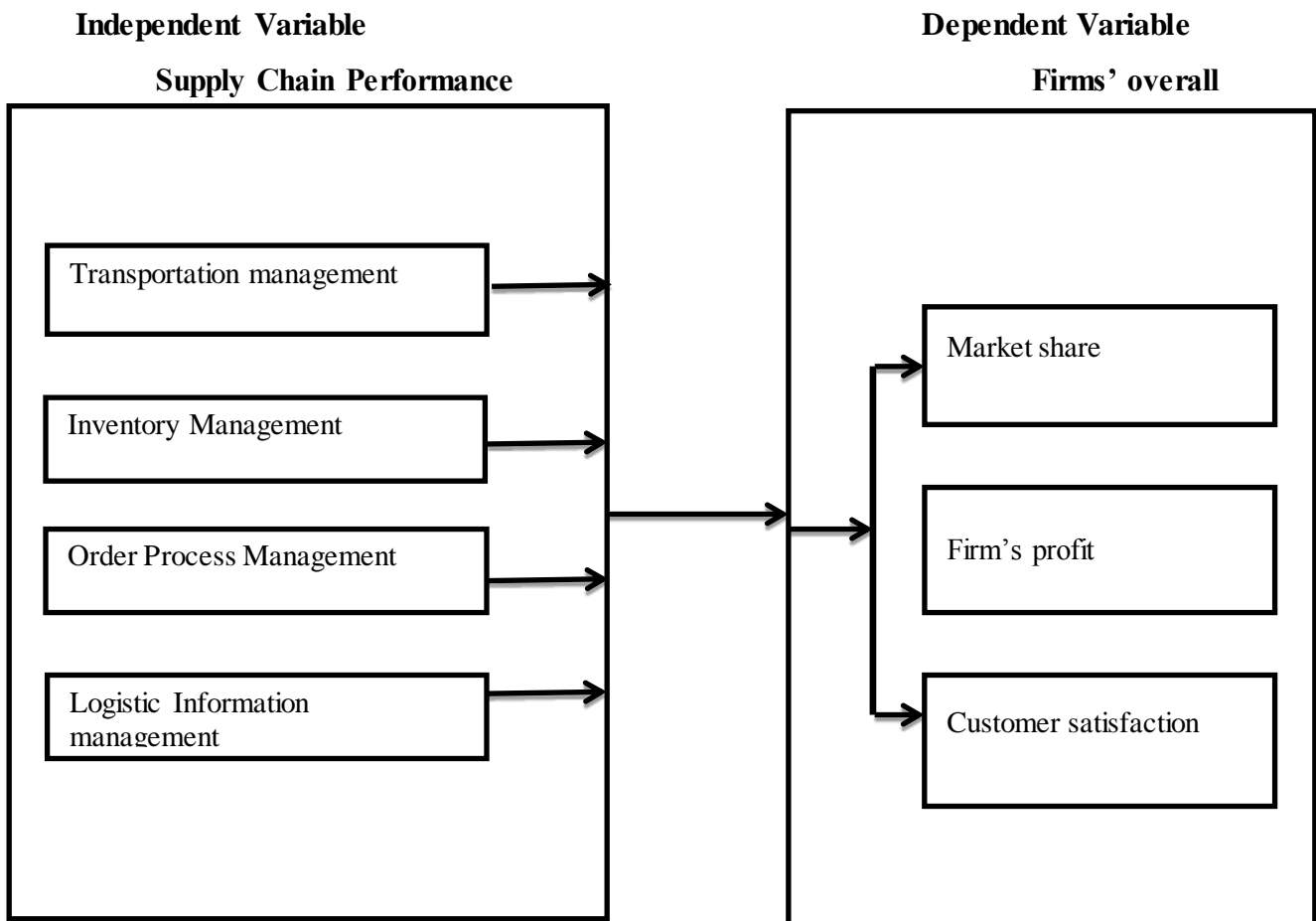
## 2.7 Conceptual Hypotheses

The hypotheses to be tested which are derived from the conceptual framework are as follows;

$H_{01:}$ There is no significant relationship between transport management system and performance of state owned firms in the energy sector

$H_{02:}$ There is no significant relationship between inventory management systems and performance of state owned firms in the energy sector

**H$_{03}$**: There is no significant relationship between order process management and performance of state owned firms in the energy sector

**H$_{02}$**: There is no significant relationship between logistic information management and performance of state owned firms in the energy sector.

# CHAPTER THREE: METHODOLOGY

## 3.1 Introduction

This chapter provides the foundation for documenting the relationship between supply chain performance and performance of state owned firms in Kenyan energy sector. In particular, this section introduces the examination procedure that was connected in directing the investigation This involve the research design, target population, sampling design and sample size, data collection procedures and instrument, determination of reliability and validity as well as data analysis techniques.

## 3.2 Research Design

Descriptive study design was utilized to explore the relationship between supply chain performance and performance of state owned firms in the Kenyan energy sector. In particular, descriptive study design is deemed appropriate for this study due to its robustness in estimating the relationships between study variables as envisaged by previous international business research (Otieno, 2008; Mushuku, 2006; Zekir and Angelova 2011).This study intends to generate concise information on the influence of supply chain performance and performance of firms in the state owned energy sector. While the study phenomena and constructs under investigation are known, the aim of the current study is to describe them explicitly through empirical investigation. Both analytical and predictive models were used to demonstrate the association between the variables under the study. In particular the research methodology adopted in the current study has been purposely designed to be confirmatory in nature. In order to empirically test the relationship between supply chain performance and performance of firms in the state owned energy sector in Kenya as envisaged in the conceptual framework of this study, survey instrument was designed to collect data.

## 3.3 Population

State owned firms in the Kenyan energy sector formed the research setting. The choice of this study setting was informed by the current literature which suggests that supply chain performance could influence the performance of firms in the state owned energy sector (Cheong et al, 2011: Manzoor, 2014: Victor et al 2006). Furthermore, limiting the

investigation to a single country may help in controlling for extraneous potentially confounding variables such as cognitive cultural and legal institutions that can result in differences in the institutional environment within which the firm operate.

This study employed a form of a census of all the state owned firms in the Kenyan energy sector as listed in appendix 2. A total of 88 questionnaires were administered to purposively select respondents the state owned firms in the energy sector consisting of senior managers and procurement officers. Specifically purposive examining strategy was utilized to choose the respondents from each of the firms.

## 3.4 Data Collection

Data was gathered through structured questionnaires received from comparable pertinent investigations with a few changes went for tending to the particular setting. Keeping in mind the end goal to assess singular thing substance and reaction design, the modified overview was additionally refined through pre-testing.

The questionnaire package was sent to potential respondents. In particular, the questionnaire included a cover letter laying out the motivation behind the examination, an introductory letter from the University of Nairobi, Graduate School of Business. questionnaire. Bearings on the most proficient method to react to the survey and classification issues were featured toward the start of the questionnaire or poll. The research questionnaire, cover letter and relevant information are contained in Appendix I.

The respondents consisted of consisting of senior managers and procurement officers of state owned firms in the energy sector in Kenya. This study employed self-administered survey approach. Particularly, the questionnaires were hand delivered to the respective firms. Primary data was used to address the constructs of supply chain performance and its relationship with the performance of firms in the state owned energy sector in Kenya. Respondents were made a request to evaluate scales operationalizing the investigation factors from a semi organized survey containing direct measures and likert sort scales.

This study is underpinned by a number of assumptions. In particular, the questionnaire was constructed based on the assumption that senior managers and procurement officers were master sources and had been utilized as a part of various firm execution look into examines for their capacity to give the bits of knowledge or experience important to answer particular study questions. Further, the methodology in general assumes that the responses from the respondents were a representative of the firms' behavior and practices.

## 3.5 Data Reliability and Validity

Enduring quality gives testimony regarding the consistency and robustness of the measuring instrument. The regular inner consistency measure is the Cronbach's Alpha, given as follows:

$$a = \frac{N\text{-}r}{1+ (N\text{-}I)\, r}$$

Where;

N = the number of segments or things being tried

a = the degree to which an arrangement of test things can be dealt with as measuring a solitary variable

r = the normal of all relationship coefficients

Cronbach's alpha co-efficient above was used to test for reliability of supply chain performance and performance of firms in the state owned energy sector in Kenya. Cronbach's Alpha approach was employed to measure internal consistency of the questionnaire items. Nonetheless, unwavering quality does not naturally infer legitimacy on the grounds that while a dependable measure is measuring something reliably, it may not really be what should gauge. In this manner, test legitimacy was the precondition to test on dependability since test legitimacy is required before unwavering quality can be viewed as important in any capacity. A pre-test was thus further conducted in order to increase the validity of the questionnaires. Consequently a test-retest approach method and expert judgment was applied to test the validity of the measuring instruments.

## 3.6 Data Analysis

Descriptive and inferential statistics was employed to encourage data investigation. Inferential statistics included regression modeling. The selection of information examination method was supported and educated by the investigation objective. The current study documents the relationship or connections between supply chain performance and performance of state owned firms in the energy sector in Kenya. Multiple regression analysis was utilized to establish the relationship or connection between supply chain performance and performance of firms. The regression model is as follows;

$$Y = \beta_0 + \beta 1X_1 + \beta 2X_2 + \beta 3X_3 + \beta 4X_1 + ę$$

Y= Firm's Performance

$X_1$= Transport management

$X_2$= Inventory Management

$X_3$= Order Process Management

$X_1$= Logistic Information Management

e=error term

β = Regression Coefficient

In the model $\beta_0$ is the steady term while the coefficients β1, β2 β3, β4 was be utilized to gauge the sensitivity of the dependent or reliant variable to a unit change in the explanatory variables while e is the error term which catches the unexplained varieties in the model

Data analysis was performed in a number of stages. Once the questionnaires are collected, data from the questionnaire was be coded, analyzed and items grouped into the various dimensions of constructs. Data screening was be performed. Survey responses were entered into SPSS version 20 for initial descriptive data analysis. General attributes of the respondents, reaction rates and estimation contrasts were examined. Descriptive measurements or statistics was utilized to test for the typicality of information and

nearness of anomalies. The Shapiro Wilks test, measures of skewness and kurtosis was assessed.

# CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND DISCUSSION OF FINDINGS

## 4.1 Introduction

The results of the data analysis are presented in this chapter. This chapter is divided into four key sections. The first section presents the background information of the respondents, the second section presents the results of the firm's supply chain performance, the third section presents the results of firm's performance and the last section presents the outcome of the regression model and its interpretation.

## 4.2 Response Rate Respondents

This study sought to collect data from 88 respondents involving supply chain officers and designated managers of state owned firms in the energy sector in Kenya. The investigator managed to collect 84 questionnaires representing a reaction rate of 95%. This reaction rate was deemed fit for analysis.

## 4.3 Descriptive Analysis

This section presents descriptive analysis for variables used in this study. This section is divided into two parts namely; descriptive analysis for the independent and dependent variables. The independent variable of the current study is supply chain performance while the dependent variable is firm performance.

### 4.3.1 Supply chain Performance

Supply chain performance was measured by four main constructs i.e. transport management, inventory management, order processing and logistic information system. The respondents were made a request to demonstrate the degree to which their organizations used these constructs. A Likert scale of 1-5 was used to rate their responses, where1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent. These constructs are discussed below

**Transport Management**

The results of the respondents' rating on the extent to which their firms used transport management system is presented in table 4.1

**Table 4.1; Transport Management**

| Transport management | | Not at all | Small extent | Moderate extent | Great extent | Very great extent | Total | Mean | Std deviation |
|---|---|---|---|---|---|---|---|---|---|
| Fleet management system | F | 0 | 0 | 0 | 6 | 78 | 84 | 4.92 | 0.259 |
| | % | 0.0 | 0.0 | 0.0 | 7.1 | 92.9 | 100 | | |
| Fuel management system | F | 0 | 12 | 17 | 7 | 48 | 84 | 4.08 | 0.937 |
| | % | 0.0 | 14.3 | 20.2 | 8.3 | 57.1 | 100 | | |
| Vehicle Tracking system | F | 2 | 16 | 25 | 33 | 8 | 84 | 3.35 | 1.163 |
| | % | 2.4 | 19.0 | 29.8 | 39.3 | 9.5 | 100 | | |
| Route planning | F | 0 | 10 | 26 | 40 | 8 | 84 | 3.55 | 0.624 |
| | % | 0.0 | 11.9 | 31.0 | 47.6 | 9.5 | 100 | | |
| Vehicle inspection schedule | F | 0 | 2 | 6 | 29 | 47 | 84 | 4.44 | 0.975 |
| | % | 0.0 | 2.4 | 7.1 | 34.5 | 56.0 | 100 | | |
| Disposal policy | F | 0 | 3 | 7 | 28 | 46 | 84 | 4.39 | 1.007 |
| | % | 0.0 | 3.6 | 8.3 | 33.3 | 54.8 | 100 | | |
| Vehicle inspection schedule | F | 0 | 2 | 6 | 29 | 47 | 84 | 4.44 | 0.827 |
| | % | 0.0 | 2.4 | 71 | 34.5 | 56.0 | 100 | | |
| Fleet control system | F | 2 | 7 | 49 | 12 | 14 | | 3.35 | 0.733 |
| | % | 2.4 | 8.3 | 58.3 | 14.3 | 16.7 | | | |
| Preventive maintenance | F | 2 | 0 | 0 | 43 | 39 | 84 | 4.42 | 0.791 |
| | % | 2.4 | 0.0 | 0.0 | 51.2 | 46.4 | 100 | | |

*Key: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

**Source: Author, 2017**

Most of the respondents demonstrated that fleet management system (mean=4.92),fuel management system (mean=4.08), vehicle inspection schedule (mean=4.44) and preventive maintenance (mean=4.42) were used to great extent. However, fleet control

system (mean=3.35), route planning system (mean=3.55) and vehicle tracking system (mean=3.55) was used to a moderate extent by most of the firms.

These findings imply that most of the state owned firms in the energy sector appreciated the usage of transport management system in their operations. However; a few firms in the energy sector in Kenya did not appreciate the use of transport management system in their operations.

**Inventory Management Systems**

The results of the respondents' rating on the degree to which their firms used inventory management systems is displayed in table 4.2

**Table 4.2; Inventory Management Systems**

| Inventory Management system | | Not at all | Small extent | Moderate extent | Large extent | Very great extent | Total | **Mean** | **Std Deviation** |
|---|---|---|---|---|---|---|---|---|---|
| JIT replenishment | F | 4 | 2 | 17 | 37 | 24 | 84 | 3.89 | 0.804 |
| | % | 4.8 | 2.4 | 20.2 | 44.0 | 28 | 100 | | |
| Automated recording | F | 4 | 5 | 22 | 33 | 20 | 84 | 3.71 | 0.843 |
| | % | 4.8 | 6.0 | 26.2 | 39.3 | 23.8 | 100 | | |
| Cycle counting | F | 6 | 4 | 1 | 43 | 30 | 84 | 4.04 | 0.957 |
| | % | 7.1 | 4.8 | 1.2 | 51.2 | 35.7 | 100 | | |
| EOQ model | F | 1 | 0 | 0 | 20 | 63 | 84 | 4.71 | 0.786 |
| | % | 1.2 | 0 | 0 | 23.8 | 75 | 100 | | |
| Inventory control | F | 0 | 4 | 4 | 34 | 42 | 84 | 4.35 | 0.596 |
| | % | 0 | 4.8 | 4.8 | 40.5 | 50.0 | 100 | | |
| Response based replenishment | F | 1 | 2 | 15 | 56 | 10 | 84 | 3.86 | 0.696 |
| | % | 1.2 | 2.4 | 17.9 | 66.7 | 11 | 100 | | |

*Key: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

**Source: Author, 2017**

The findings suggest that EOQ model (m=4.71), inventory control (m=4.35) and cycle counting (m=4.04) were used to a great extent by most of the firms. Nonetheless JIT replenishment (m=3.89) and Response based replenishment (m=3.86) were used to a

moderate extent by most of the firm. The findings shows that most of the state owned firms in energy sector in Kenya appreciated the usage of inventory management system in their operations. Nonetheless, a few of the firms did not appreciate the use of inventory management system in their operations.

**Order Processing Management**

The results of the respondents' rating on the extent to which their firm used order processing managements presented in table 4.3.

**Table 4.3; Order Processing Management**

| Order Processing Management | | Not at all | Small extent | Moderate extent | Large extent | Very great extent | Total | Mean | Std Deviation |
|---|---|---|---|---|---|---|---|---|---|
| Use electronic order processing | F | 0 | 0 | 20 | 26 | 38 | 84 | 4.21 | 0.807 |
| | % | 0 | 0 | 23.8 | 31 | 45.2 | 100 | | |
| Deliver right quality of products at first order | F | 1 | 3 | 13 | 38 | 29 | 84 | 4.08 | 0.867 |
| | % | 1.2 | 3.6 | 15.5 | 45.2 | 34.5 | 100 | | |
| Orders processed on time | F | 0 | 1 | 5 | 29 | 49 | 84 | 4.50 | 0.667 |
| | % | 0 | 1.2 | 6 | 34.5 | 58.3 | 100 | | |
| Use order processing system | F | 2 | 0 | 2 | 23 | 57 | 84 | 4.58 | 0.763 |
| | % | 2.4 | 0 | 2.4 | 27.4 | 67.9 | 100 | | |
| Achieve timely delivery of goods | F | 1 | 15 | 2 | 57 | 9 | 84 | 3.69 | 0.931 |
| | % | 1.2 | 17.9 | 2.4 | 67.9 | 10.7 | 100 | | |
| Ensure internal satisfaction | F | 4 | 13 | 17 | 5 | 45 | 84 | 3.88 | 1.338 |
| | % | 4.8 | 15.5 | 20.5 | 6 | 53.6 | 100 | | |
| Ensure zero double payments | F | 0 | 4 | 2 | 41 | 37 | 84 | 4.32 | 0.747 |
| | % | 0 | 4.8 | 2.4 | 48.8 | 44 | 100 | | |
| Achieve minimum order processing costs | F | 4 | 2 | 17 | 37 | 24 | 84 | 3.89 | 1.006 |
| | % | 4.8 | 2.4 | 20.2 | 44 | 28.6 | 100 | | |
| Smooth information flow to all logistics functions | F | 4 | 5 | 22 | 33 | 20 | 84 | 3.71 | 1.047 |
| | % | 4.8 | 6 | 26.2 | 39.3 | 23.8 | 100 | | |
| Invested on | F | 6 | 4 | 1 | 43 | 30 | 84 | 4.04 | 1.102 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| information communication systems | % | 7.1 | 4.8 | 1.2 | 51.2 | 35.7 | 100 | | |
| Achieve accurate demand forecasting | F | 0 | 4 | 4 | 34 | 42 | 84 | 4.36 | 0.786 |
| | % | 0 | 4.8 | 4.8 | 40.5 | 50 | 100 | | |
| Achieve timely response to customer references | F | 1 | 0 | 0 | 20 | 63 | 84 | 4.71 | 0.592 |
| | % | 1.2 | 0 | 0 | 23.8 | 75 | 100 | | |
| Achieve smooth flow of materials and products | F | 4 | 2 | 17 | 37 | 24 | 84 | 3.89 | 1.006 |
| | % | 4.8 | 2.4 | 20.2 | 44 | 28.6 | 100 | | |
| Use electronic order processing | F | 4 | 5 | 22 | 33 | 20 | 84 | 3.71 | 1.047 |
| | % | 4.8 | 6 | 26.2 | 39.2 | 23.8 | 100 | | |
| Use electronic customer feedback | F | 6 | 4 | 1 | 43 | 30 | 84 | 4.04 | 1.102 |
| | % | 7.1 | 4.8 | 1.2 | 51.2 | 35.7 | 100 | | |

*Scale: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

**Source: Author, 2017**

The findings recommend that following develops of order processing management constructs were used to a great extent by most of the firms: utilization of electronic order or request processing (mean=4.21), delivery of right quality of products at first order (mean=4.08), processing of orders on time (mean=4.50), use of order processing system (mean=4.58), investment on information communication systems (mean=4.04),achievement of accurate demand forecasting, (mean=4.36) achievement of timely response to customer references, (mean=4.71) and use of electronic customer feedback (mean=4.04). However most of the respondents indicated that the firms achieved timely delivery of goods to moderate extent (mean=3.69), ensured internal satisfaction to a moderate extent (mean=3.88), achieved smooth flow of all logistic functions to moderate extent (mean=3.71), achieved minimum order processing costs to a moderate extent (mean=3.89) and achieved timely response to customer references to a moderate extent (mean=3.89). These findings shows that most of the state owned firms in the energy sector in Kenya appreciated the use the order processing management system

in their operations. However, a few firms of the firms did not appreciate the use of order process management system in their operations.

**Logistics Information Systems**

The results of the respondents' rating of the extent to which logistic information systems was used by their firms is presented in table 4.4

**Table 4.4; Logistics Information Systems**

| Logistics information system | | Not at all | Small Extent | Moderate extent | Large Extent | Very Great Extent | Total | Mean | Std deviation |
|---|---|---|---|---|---|---|---|---|---|
| Use of load planning system | F | 2 | 0 | 2 | 23 | 57 | 84 | 4.58 | 0.763 |
| | % | 2.4 | 0 | 2.4 | 27.4 | 67.9 | 100 | | |
| Invested in transport management system | F | 4 | 2 | 17 | 37 | 24 | 84 | 3.89 | 1.006 |
| | % | 4.8 | 2.4 | 20.2 | 44 | 28.6 | 100 | | |
| Practice terminal management systems | F | 4 | 5 | 22 | 33 | 20 | 84 | 3.71 | 1.047 |
| | % | 4.8 | 6 | 26.2 | 39.3 | 23.8 | 100 | | |
| Warehouse management system | F | 6 | 4 | 1 | 43 | 30 | 84 | 4.04 | 1.102 |
| | % | 7.1 | 4.8 | 1.2 | 51.2 | 35.7 | 100 | | |
| Use of vender selection system | F | 0 | 4 | 4 | 34 | 42 | 84 | 4.35 | 0.786 |
| | % | 0.0 | 4.8 | 4.8 | 40.5 | 50 | 100 | | |
| E-customer relationship system | F | 1 | 0 | 0 | 20 | 63 | 84 | 4.72 | 0.592 |
| | % | 1.2 | 0.0 | 0.0 | 23.8 | 75 | 100 | | |
| Practice financial management system | F | 1 | 2 | 15 | 56 | 10 | 84 | 3.86 | 0.696 |
| | % | 1.2 | 2.4 | 17.9 | 66.7 | 11.9 | 100 | | |

*Scale: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

Most of the respondents indicated that that their firms used load planning system to a great extent (mean=4.58), invested in transport management system to a moderate extent(mean=3.89), practiced terminal management systems to a moderate extent (mean=3.71), used warehouse management system to a large extent (mean=4.04), used vender selection system to a large extent (mean=4.35), used E-customer relationship system to a large extent(mean=4.72) and practiced financial management system to a moderate extent (mean=3.86). The findings suggest that most of the state owned firms in the energy sector in Kenya appreciated the use of logistic information system in their operations. However, a few of the firms did not appreciate the use of logistic information system in their operations.

## 4.3.2 Descriptive Analysis for Dependent Variable

The dependent variable for the current study is firm performance. Firm performance was measured by three constructs. This involves; market share, firms' profit and customer satisfaction. The respondents were solicited to show the degree of performance of their organizations based on the market share, firms' profit and customer satisfaction. A Likert scale of 1-5 was used to rate their responses, where1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent. These constructs are discussed below.

**Market Share**

The results of the respondents' rating of their firms growth in market share over the last five years is presented in table 4.5

**Table 4.5; Market Share**

| Market Share | | Not at all | Small extent | Moderate extent | Large extent | Very great extent | Total | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|---|---|
| The firm has grown in market share | F | 1 | 0 | 0 | 20 | 63 | 84 | 4.71 | 0.592 |
| | % | 1.2 | 0 | 0 | 23.8 | 75.0 | 100 | | |
| The firm has grown in sales | F | 1 | 2 | 15 | 56 | 10 | 84 | 3.86 | 0.696 |
| | % | 1.2 | 2.4 | 17.9 | 66.7 | 11.9 | 100 | | |

| The firm has improved in overall performance | F | 1 | 3 | 13 | 38 | 29 | 84 | 4.08 | 0.867 |
| | % | 1.2 | 3.6 | 15.5 | 45.2 | 34.5 | 100 | | |

*Scale: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

**Source: Author, 2017**

Most of the respondents indicated that their firms had grown in market share to a large extent (mean=4.71) and improved in overall performance to a large extent (mean=4.08). In any case, greater part of the respondents demonstrated that their firms had grown in sales to a moderate extent (3.86). The findings show that the market share of most of the state owned firms in the Kenyan energy sector had grown over the five years. Nonetheless, a few of the firms did not experience growth in the market over the last five years

**Firms' Profits**
The results of the respondents' rating of their firms profit over the last five years is presented in table 4.6

**Table 4.6: Firms' Profit**

| Firm's Profit | | Not at all | Small extent | Moderate extent | Large extent | Very great extent | Total | Mean | Standard deviation |
|---|---|---|---|---|---|---|---|---|---|
| Profitability growth | F | 0 | 1 | 5 | 29 | 49 | 84 | 4.50 | 0.667 |
| | % | 0 | 1.2 | 6.0 | 34.5 | 58.3 | 100 | | |
| Firms return on assets growth | F | 1 | 15 | 2 | 57 | 9 | 84 | 4.58 | 0.763 |
| | % | 1.2 | 17.9 | 2.4 | 67.9 | 10.7 | 100 | | |
| Firms return on sales growth | F | 2 | 0 | 2 | 23 | 57 | 84 | 3.69 | 0.931 |
| | % | 2.4 | 0 | 2.4 | 27.4 | 67.9 | 100 | | |
| Firms return on investment | F | 4 | 13 | 17 | 5 | 45 | 84 | 3.69 | 1.338 |
| | % | 4.8 | 15.5 | 20.2 | 6.0 | 53.6 | 100 | | |

*Scale: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

Most of the respondents indicated that their firms had experienced profitability growth and return on asset growth to a large extent mean= (4.50 and 4.58) respectively. Nonetheless, the firms experienced return on sales growth and return on investment to a moderate extent (mean=3.69) respectively. This implies that majority of the state owned firms in the energy sector had experienced improved financial performance. This could be attributed to stable macroeconomic conditions that are favorable for business.

**Customer Satisfaction**

The results of the respondents' rating of their firms customer satisfaction is presented in table 4.1

**Table 4.7; Customer Satisfaction**

| Customer Satisfaction | | Not at all | Small extent | Moderate extent | Large extent | Very large extent | Total | Mean | Std Deviation |
|---|---|---|---|---|---|---|---|---|---|
| Provision of quality products to customers | F | 0 | 4 | 2 | 41 | 37 | 84 | 0.747 | 0.747 |
| | % | 0 | 4.8 | 2.4 | 48.8 | 44.0 | 100 | | |
| Decrease on customer complaints | F | 2 | 6 | 2 | 12 | 62 | 84 | 1.011 | 1.011 |
| | % | 2.4 | 7.1 | 2.4 | 14.2 | 73.8 | 100 | | |
| Customers compliment to the firm | F | 0 | 1 | 2 | 68 | 13 | 84 | 0.466 | 0.466 |
| | % | 0 | 1.2 | 2.4 | 81 | 15.5 | 100 | | |
| Growth in value added productivity | F | 0 | 4 | 0 | 12 | 68 | 84 | 0.704 | 0.704 |
| | % | 0 | 4.8 | 0 | 14.3 | 81.0 | 100 | 0.747 | |

*Scale: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

Most of the respondents indicated that their firms provided quality products to customers to their customers to a large extent (mean =4.32), experienced a decrease in customer complaints to a large extent (mean=4.50), experienced compliment to the firm to a large extent(mean=4.11) and experienced growth in value added productivity to a large extent(mean=4.71). The findings imply that most of the state owned firms in Kenyan energy sector satisfied the needs of their customers to a great extent.

## 4.4 Inferential Analysis

This section presents multiple linear regression analysis for variables used in this study. The independent variable of the current study is supply chain performance while the dependent variable is firm performance. The outputs of the regression analysis are discussed as follows.

**Regression Analysis**.

Multiple linear Regressions analysis was used to check the relationship between supply chain performance and performance of state owned firms in the energy sector in Kenya with the constructs of supply chain performance as the independent variables and the constructs of firm performance as the dependent variable. The outcome of the regression analysis are discussed as follows.

**Table 4.8 Model Summary**

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|------|----------|-------------------|----------------------------|
| 1 | .790[a] | .625 | .606 | .21668 |

a. Predictors: (Constant), Inventory Management, Transport Management, Logistic Information System, Order Process Management

R-squared was used to estimate the closeness of the data to the fitted regression line (coefficient of determination). The value of variance $R^2=0.625$ indicate that 62.5% of the firm's performance is explained by transport management, inventory management, order process management and logistic information management. This shows that model fits the data.

**Table 4.9; ANOVAa**

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 6.174 | 4 | 1.543 | 32.872 | .000[b] |
| | Residual | 3.709 | 79 | .047 | | |
| | Total | 9.883 | 83 | | | |

a. Dependent Variable: Performance

b. Predictors: (Constant), Inventory Management, Transport Management, Logistic Information System, Order Process Management

The value of $F_{(4, 79)} = 32.872$, P-value $< 0.05$ shows that supply chain performance significantly predicts firms' performance. This shows that the regression model show altogether predicts the result variable and is solid match for the information

**Table 4.10 Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients | | |
|---|---|---|---|---|---|---|
| | | B | Std. Error | Beta | t | Sig. |
| 1 | (Constant) | -.099 | .491 | | -.201 | .841 |
| | Transport Management | .487 | .108 | .335 | 4.491 | .000 |
| | Order Process Management | .497 | .132 | .555 | 3.771 | .000 |
| | Logistic Information System | .327 | .105 | .432 | 3.128 | .002 |
| | Inventory Management | .428 | .082 | .416 | 5.209 | .000 |

a. Dependent Variable: Performance

The findings show that transport management, order process management, logistic information system and inventory management significantly ($p < .05$) predicts firms' performance respectively.

The regression model is given by;

*Performance = 0.497× Order process management + 0.487× Transport management + 0.428×Inventory management+ 0.327×Logistic information system*

The model shows that unit increase each of the predictor variables increases the performance of firms by a positive unit of the value of the respective factors. Order process management was the predictor variable which increases performance of firms by higher value (0.497), followed by order transport management (0.487), inventory management (0.428) and the least is logistic information system (0.327). The findings imply that all the four constructs of supply chain performance significantly predict firm performance. Therefore, an improvement in transport management, order processing management, logistic information system and inventory management results on a positive significant increase in firm performance.

**Hypothesis**

$H_{01}$: *There is no critical connection between transport management system and performance of state owned firms in the energy sector*

The regression analysis suggests that transport management positively predicts performance of state owned firms in the energy sector ($p < 0.05$, $\beta=0.487$). Hence dismiss the null hypothesis which states that there is no critical connection between transport management system and performance of state owned firms in the energy sector. In particular, a unit increases in transport management increases performance of state owned firms in the energy sector by a value of 0.487. These findings suggest that state owned firms in the energy sector that have integrated transport management systems in their daily operations experience improved performance.

$H_{02}$: *There is no critical connection between inventory management systems and performance of state owned firms in the energy sector*

The results of the regression analysis show that inventory management systems positively predicts performance of state owned firms in the energy sector ($p < 0.05$, $\beta=0.428$). Hence reject the null hypothesis which states that there is no critical

connection between inventory management system and performance of state owned firms in the energy sector. In particular, a unit increases in inventory management systems increases performance of state owned firms in the energy sector by a value of 0.497. the findings imply that firms that integrated inventory systems in their daily operations experience improved performance.

**H$_{03}$:** *There is no critical connection between order process management and performance of state owned firms in the energy sector*

The findings of the regression analysis show that order process management positively predicts performance of state owned firms in the energy sector ($p < 0.05$, $\beta=0.497$). Hence dismiss the null hypothesis which states that there is no critical connection between order processing management and performance of state owned firms in the energy sector. In particular, a unit increases in order processing management increases performance of state owned firms in the energy sector by a value of 0.497. These findings suggest that firms that have integrated order processing management in their daily operations experience improved performance.

**H$_{04}$:** *There is no critical connection between logistic information management and performance of state owned firms in the energy sector*

The regression analysis suggests that logistic information management positively predicts performance of state owned firms in the energy sector ($p < 0.05$, $\beta=0.327$). Hence dismiss the null hypothesis which states that there is no critical connection between logistic information management and performance of state owned firms in the energy sector. In particular, a unit increases in logistic information management increases performance of state owned firms in the energy sector by a value of 0.327. These findings suggest that state owned firms in the energy sector that have integrated logistic information management in their daily operations experience improved performance.

## 4.5 Summary and Interpretation of Findings

The findings of the current research suggest that integration of transport management in the daily operations of the firm creates a positive impact on the overall performance. This could be due the fact that transport management enhances supply chain and distribution of products to boost market share, improve cost efficiency, and reduce lead time

The findings of the current study is in tandem with a study conducted by Ahumada and Villalobos (2004) who alludes that transport management is an important supply chain component that requires a dedicated attention to keep track of since it stands for about 60% of the of the total supply chain cost together with inventory management. The discoveries of the current investigation are likewise in predictable with a study conducted by Otieno (2008) who found that efficient transport management system is positively associated with improved supply chain efficiency, minimized operation cost and improved service quality of firms. In sum, transportation provides a link between production, storage and subsequent consumption hence the success of the supply chain performance relies upon a good execution of transportation management systems.

The findings of the current study show that inclusion of inventory management in the daily operations of the firm improves performance of firms. This could be due to the fact inventory management minimizes wastage of materials and improves utilization of resources and production quality. These findings are in tandem with studies conducted by Muller, (2015) who opines that the supply chain performance of any firm is driven by inventory management. The aftereffects of the present examination are also in tandem with a investigation conducted by Melo et al. (2009) who found that the key to effective supply chain performance is rested on efficient inventory management system. In particular Melo et al. (2009) found out that an efficient inventory management system is based on five key constructs. These constructs include; segmentation of customers; profitability of products; integration of transport; competitive and time based performance. As such, the ability of a firm to deliver to meet the customers' inventory

needs was deemed as a major competitive factor. In sum, state owned firms that have inventory management tied to their daily operations experience improved performance.

The aftereffects of the current examination indicate that investing in order process management improves performance of firms. This could be due to the fact order process management enhances proper tracking of order movements, creates customer loyalty and ensures timely  processing of orders .

These findings are in tandem with studies conducted by Ahumada & Villalobos (2004) who opines that order processing management forms the foundation of information flow in a supply chain system and enhances supply chain performance by creating a flow of information that precede products and accompany them.

The results of the current study are also in consistent with a study conducted by  Van-Weele (2005) found out that order processing system forms a communication network that provides essential information for efficient management of the link between supply chain and other areas of the firm and within supply chain. In particular, order processing commences with the acceptance of the order by the firm and remains incomplete until all the order is received by the customer in a reliable and timely manner. In sum, effective order processing management relies on a successful work balancing and enhanced information exchange. As such, accurate and quick processing of orders contributes to efficient flow of goods. Firms should focus on efficient processing and regularly evaluate its order processing systems based on indicators that are capable of tracking flexibility, reliability and timeliness of handling orders.

The findings of the current study show that investing in logistic information system improves firms' performance. This could be due to the fact that logistic information system enhances innovation and creates a platform for information sharing between the suppliers and the customers. These findings are in tandem with a research done by Wu et al. (2013) who discovered that logistic information sharing, nature of information and the amount of information has a significant impact on the supply chain performance. The

findings of the current study are also in consistent with a study by Kumar (2014) who opines that integration of the aspect of information sharing in the supply chain system is crucial for forecasting and planning in particular, all firms require forecasting and planning, whereas logistic information system is fundamentally important to the performance of the firm, effective logistic information system relies on sharing accurate and detailed information at the right time (Ahumada & Villalobos, 2004).

# CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

## 5.1 Summary of Findings

The findings of the study suggest that transport management positively predicts performance of state owned firms in the energy sector. Hence dismiss the null or invalid hypothesis which states that there is no huge connection between transport management system and performance of state owned firms in the energy sector. These findings show that transportation management provides a link between production, storage and subsequent consumption hence the success of the firms performance relies upon a good execution of transportation management systems.

The results of the study indicate that inventory management systems positively predict performance of state owned firms in the energy sector in Kenya. Hence reject dismiss the null or invalid hypothesis which states that there is no huge connection between inventory management system and performance of state owned firms in the energy sector. The findings shows that firms that have integrated inventory systems in their daily operations experience improved performance due to segmentation of customers and profitability of products

The findings of the study indicate that order processing management positively predicts performance of state owned firms in the energy sector. Hence dismiss the null or invalid hypothesis which states that there is no huge connection between order processing management and performance of state owned firms in the energy sector. The findings imply that order process management enhances proper tracking of order movements, creates customer loyalty and ensures timely processing of orders.

The findings suggest that logistic information management positively predicts performance of state owned firms in the energy sector. Hence dismiss the null or invalid hypothesis which states that there is no huge connection between logistic information management and performance of state owned firms in the energy sector. The findings

show that integration of the aspect of logistic information in the supply chain system is crucial for forecasting and planning. In particular, all firms require forecasting and planning, whereas logistic information system is fundamentally important to the performance of the firm, effective logistic information system relies on sharing accurate and detailed information at the right time which results in improved firm performance

## 5.2 Conclusion

This research aimed to establish the relationship or connection between supply chain performance and performance of state owned firms in the energy sector in Kenya. The findings of the research indicate that all the four constructs of supply chain performance significantly predicted firm performance. The study established that transport management, order processing management, logistic information system and inventory management significantly predicts firms' performance. The model shows that unit increase each of the predictor variables increases the performance of firms by a positive unit of the value of the respective factors. In particular, an improvement in transport management, order processing management, logistic information system and inventory management results on a positive significant increase in firm performance. Therefore, this study concludes that supply chain performance significantly predicts firm performance.

In sum, supply chain performance was found to have a massive tremendous relationship with performance of state owned firms in the energy sector in Kenya. Therefore supply chain performance needs to be integrated at all levels of the firms' operation while taking into account transport management, order processing management, logistic information system and inventory management since this will go a long way in improving the overall performance of the firm

## 5.3 Recommendations for Policy and Practice

The current study found out that transport management positively predicts performance of state owned firms in the energy sector. Therefore, this study recommends that procurement managers should integrate transport management in their daily operations by enhancing procurement and distribution of products to boost market share, improve

cost efficiency, reduce lead time and create a positive effect on the overall performance of the firm.

This outcome shows that inventory management systems positively predict performance of state owned firms in the energy sector in Kenya. Hence, this study prescribes for inclusion inventory management in the daily operations of firms to reduce manufacturing costs, ensure proper utilization of resources, enhance production quality, minimize wastage of materials and improve quality of services to the customers thus impacting positively on the overall performance of the firm.

The analysis of the study indicate that order processing positively predict performance of state owned firms in the energy sector in Kenya. Therefore, this investigation prescribes that procurement managers should ought to incorporate order process management in their daily operations such proper tracking of order movements, creating customer loyalty, processing orders in a timely manner, timely delivery of orders and investing on electronic order processing since this will go a log in improving the overall performance of the firm

The current study suggests that logistic information management positively predicts performance of state owned firms in the energy sector. As a result, there is a need for managers to invest in logistic information management in order to enhance innovation and create a platform for information sharing between the suppliers and the customers and by extension improve the overall performance of the firm

## 5.4 Limitations of the Study

While the participants of the current investigation consisted of senior persons from the procurement departments of state owned firms in the energy sector in Kenya, they represent only individual perceptions and not necessarily the perception of other members of the firm regarding the procurement performance and firm performance. In addition, the sample of the current study was drawn from all state owned firms in the energy sector in Kenya. Hence the conclusions inferred can only be generalized to state

owned firms in the energy sector in Kenya and must exclude other categories of firms. Another limitation appreciates the fact performance of firms may not only be predicted by supply chain performance but also other factors that have not been considered in the current study. Supply chain should be integrated with other functionalities such as finance, marketing and operations to support performance of firms (Ahumada & Villalobos, 2004). Hence, to predict the performance of firms solely based on supply chain performance may skew any attempted generalization.

## 5.5 Suggestions for Further studies

In light of the findings, conclusion, recommendations and the limitations of the current study, further research are suggested to uncover the following domains in order to corroborate the findings of the current study and expand the knowledge in this area.
In view of the global supply chain management trends over time, new issues influencing supply chain performance on firm performance are likely to appear, hence there is a need to identify when that happens. This can only be achieved by a continuation of research on supply chain performance. Future studies should also be conducted on the risk factors that impacts on the managerial decisions regarding the allocation of resources towards supply chain management in firms and its impact on the performance of the firm.

The current study concentrated on the state owned firms in the energy sector in Kenya. Future studies could focus on other factors such as service industry, the size of the firm and global ownership to establish significant difference among the groups that forms these demographics. For example what is the connection between supply chain performance and performance of firms in the private firms in the energy sector as opposed state owned firms?

Additional empirical evidence on the relationship or connections between supply chain performance and performance of firms is crucial to examine the key primary components of external validity such as generalizability of the study findings, situational and conceptual replicability. Therefore, future studies should consider expanding the sample size to include both private and state owned firms in the energy sector or employ

triangulating methods to establish whether the findings of qualitative and quantitative methodologies yield consistent results.

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# APPENDICES

## APPENDIX I: QUESTIONNAIRE

I am an MBA student at The University of Nairobi and as part of the academic requirements; I'm currently conducting a research on the relationship between supply chain performance and performance of firms in the state owned energy sector in Kenya. Your response on the questionnaire will be very helpful to the success of this undertaking. The information obtained will be strictly used for academic purposes and will be treated with utmost confidentiality.

**Tick Appropriately**

### SECTION A: SUPPLY CHAIN PERFORMANCE
Kindly indicate the extent of your firms performance over the last five years using a

Likert scale of 1-5, where1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great

Extent, 5 = Very great extent.

### SUPPLY CHAIN PERFORMANCE INDICATORS

|   | Market Share | Not at all | Small Extent | Moderate extent | Large Extent | Very great extent |
|---|---|---|---|---|---|---|
| 1 | The firm has grown in market share | | | | | |
| 2 | Growth in value added productivity | | | | | |
| 3 | The firm has improved in overall performance | | | | | |
|   | **Firms Profit** | | | | | |
| 5 | Firms return on assets growth | | | | | |
| 6 | Profitability growth | | | | | |
| 7 | Firms return on sales growth | | | | | |
| 8 | Firms return on assets growth | | | | | |
| 9 | Firms return on investment | | | | | |
|   | **Customer Satisfaction** | | | | | |
| 11 | Provision of quality products to customers | | | | | |

| 12 | Decrease on customer complaints | | | | | |
|----|----------------------------------|--|--|--|--|--|
| 13 | Customers compliment to the firm | | | | | |

*Key: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

## SECTION C: SUPPLY CHAIN PERFOMANCE

Kindly indicate the extent yyour firms employ the following constructs of supply chain performance using Likert scale of 1-5, where1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent

|  | Transport management | Not at all | Small Extent | Moderate extent | Large Extent | Very large extent |
|---|---|---|---|---|---|---|
| 1 | Fleet management system | | | | | |
| 2 | Fuel management system | | | | | |
| 3 | Tracking system Vehicle | | | | | |
| 4 | Route planning | | | | | |
| 5 | Vehicle inspection schedule | | | | | |
| 6 | Disposal policy | | | | | |
| 7 | Vehicle inspection schedule | | | | | |
| | **Inventory Management system** | | | | | |
| 8 | JIT replenishment | | | | | |
| 9 | Automated recording | | | | | |
| 10 | Cycle counting | | | | | |
| 11 | EOQ model | | | | | |
| 12 | Inventory control | | | | | |
| 13 | Response based replenishment | | | | | |
| 14 | Cycle counting | | | | | |
| 15 | Fixed-period system | | | | | |
| 16 | Periodic review | | | | | |
| | **Order Processing Management** | | | | | |
| 17 | Use electronic order processing | | | | | |

| 18 | Deliver right quality of products at first order | | | | | |
|---|---|---|---|---|---|---|
| 19 | Orders processed on time | | | | | |
| 20 | Use order processing system | | | | | |
| 21 | Achieve timely delivery | | | | | |
| 22 | Ensure internal satisfaction | | | | | |
| 23 | Ensure zero double payments | | | | | |
| 24 | Achieve minimum order processing costs | | | | | |
| 25 | Smooth information flow to all logistics functions | | | | | |
| 26 | Invested on information communication systems | | | | | |
| 27 | Achieve accurate demand forecasting | | | | | |
| 28 | Achieve timely respond to customer references | | | | | |
| 29 | Achieve smooth flow of materials and products | | | | | |
| 30 | Use electronic order processing | | | | | |
| 31 | Use electronic customer feedback | | | | | |
| | **Logistics information system** | | | | | |
| 32 | Use of load planning system | | | | | |
| 33 | Invested in transport management system | | | | | |
| 34 | Practice terminal management systems | | | | | |
| 35 | Warehouse management system | | | | | |

| 36 | Use of vender selection system | | | | | |
| 37 | E-customer relationship system | | | | | |
| 38 | Practice financial management system | | | | | |

*Key: 1 = Not at all, 2 = Small Extent, 3 = Moderate Extent, 4= Great Extent, 5 = Very great extent.*

***END***

**Thanks for your participation**

**APPENDIX II: STATE OWNED FIRMS IN THE ENERGY SECTOR IN KENYA**

1.  Geothermal Development Company (GDC)

2.  Kenya Electricity Generating Company Limited (KENGEN)

3.  Kenya Electricity Transmitting Company (KETRACO)

4.  Kenya Petroleum Refineries Limited (KPRL)

5.  Kenya Pipeline Company Limited (KPC)

6.  Kenya Power and Lighting Company Limited (KPLC)

7.  National Oil Corporation of Kenya (National Oil)

8.  Rural Electrification Authority (REA)