SUPPLY CHAIN MANAGEMENT PRACTICES AND PERFORMANCE OF FIRMS IN THE ELECTRICITY ENERGY SUB-SECTOR IN KENYA

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Supply Chain Management Practices and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

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DECLARATION

This thesis is my original work and has not been presented for degree in any other University.

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This thesis has been submitted for examination with our approval as University Supervisors.

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DEDICATION

I dedicate this thesis to my late father, my late brother and my late parents' in-law. To my late dad James Munyi Macharia thanks for having a beautiful dream for me and believing in me. My late brother Japhet Njeru Munyi, though you had multiple disability, you were so valuable to me. To my late parents' in-law, Jason Karugano Kivuria and Sarah Ngembi Karugano, thanks for your love, appreciation and support from the first day I became a member of your family till the time you were promoted to glory. You were all an inspiration to my life and many a times, I wish you were around but I take the consolation that, you are all now beautiful angels watching over me.

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ACRONYMS AND ABBREVIATIONS

ADB	Asian Development Bank
AEMP	Africa Energy Market Place
AfDB	African Development Bank
AICD	Africa Infrastructure Country Diagnostic
ERC	Electricity energy sub-sector Regulatory Commission
ERS	Economic Recovery Strategy
GDC	Geothermal Development Company
GoK	Government of Kenya
HFO	Heavy Fuel Oils
HSD	High Speed Diesel
IEA	Institute of Economic Affairs
IPP	Independent Power Producers
KenGen	Kenya electricity energy Company
KETRACO	Kenya Electricity Transmission Company
KNBS	Kenya National Bureau of Statistics
KPC	Kenya Power Company
KWh	Kilo Watts per hour
MoE	Ministry of Energy
MSD	Medium Speed Diesel
MTP	Medium Term Plan

MW	Mega Watts
NT	Network Theory
PAP	Project Affected Persons
PPA	Power Purchase Agreement
PRG	Partial Risks Guarantees
RE	Renewable Energy
REA	Rural Electrification Authority
UNDP	United Nations Development Programme

DEFINITION OF OPERATIONAL TERMS

Contract Management	The process that allows both parties to the contract fulfill their commitments in order to meet the objectives required in the contract (Cruz & Marques, 2013).
Demand Forecasting	Systematic procedure of estimating the anticipated quantity of products or services that will be sought after by customers at a specific point in the future. Along with the use of technology, it has significant importance for organizations as it enables them to enhance decision-making processes pertaining to manufacturing, inventory management, pricing strategies, and marketing initiatives (Krishnaveni, 2017).
Electricity Energy Sub-Sector	A constituent of the broader energy sector, specifically dedicated to the production, transportation, and dissemination of electrical power. This encompasses the entirety of businesses and institutions engaged in these undertakings, spanning from power generation facilities to utility companies to grid management entities (MoE, 2011).
Forecasting	A statement that estimates future value of interest for a specific time period that is used as prime output in decision

	making process of Supply Chain Management (Albarune & Habib, 2015)
Performance	The quantitative or qualitative assessment of the effectiveness and efficiency of goal achievement by an organization (Samsonowa, 2012).
Procurement	Process of obtaining goods, services, and works (Changalima & Mdee 2023).
Procurement regulations Compliance	The extent of adherence to set rules and standards that govern the acquisition of goods, services and works in an organisation. (Findlay, 2018).
Risk Management	Systematic approach to the identification, assessment, evaluation, and ranking of the associated risks and allocation of the necessary resources to monitor, control, and minimize any adverse impacts of undesirable events (Perera *et al.,* 2014)
Risk	Indeterminate event or situations that will have an effect on the achievement of a venture's objectives should it occur (Association of Project Management, 2016).
Sourcing Strategy	Defining the number of suppliers a firm will have for one specific component/product/service as well as

	determining the relationship with them (Pulles *et al.,* 2014).
Strategic Sourcing	Collaborative acquisition of the organization's requirements with a focus on total cost of ownership while managing the relationships between the buyer and the suppliers (Eletantawy, Giunpero & Handfield 2014).
Supply Chain Management	The process encompassing the planning, and organization of all the undertakings involved in sourcing and procurement, transformation and all logistics management undertakings as well as harmonization and cooperation with network partners (The Council of Supply Chain Management Professionals, 2018).
Supply Chain Management Practices	Set of activities carried out in an organization to enhance effective management of its supply chain (Li, 2016).
Supply Chain Performance	The capacity of a supply chain to effectively and efficiently provide goods and services to clients, ensuring timely delivery and meeting or exceeding customer expectations, all while maintaining cost-effectiveness. Thus, assessing the efficacy of the supply chain in attaining its objectives, which encompass profit maximisation, cost

minimization, enhanced customer happiness, and reduced environmental footprint (Mangla, Kusi-Sarpong, Luthra, Bai, Jakhar & Khan, 2020).

ABSTRACT

Supply chain management practices are the aspects that affect the whole of supply chain, its parts or key procedures with an aim of eventually improving organizational performance. To reduce cost and performance challenges, organizations must put into consideration supply chain practices at various echelons of the supply chain. In Kenya, firms responsible for electricity energy sub-sector power production, transmission and distribution have had challenges in their performance. Therefore, the general purpose of this study was to assess the influence of supply chain management practices on performance of firms in electricity energy sub-sector in Kenya. Specifically, the study focused on demand forecasting, strategic sourcing, supply chain risk management and contract management as the factors influencing the performance of firms in electricity energy sub-sector in Kenya. The study also sought to determine the moderating effect of procurement regulations compliance on the performance of firms in electricity energy sub-sector in Kenya. The study adopted cross-sectional survey design. Purposive sampling technique was used to draw a sample of 375 respondents from a target population of 6052 employees from 15 firms dealing with electricity energy in Kenya. Primary data was collected using a questionnaire. Document analysis was used to collect secondary data. Qualitative data was grouped in to themes. The descriptive analysis was employed. The data collected was analyzed in form of frequencies; means and standard deviation were generated. Means measured central tendency while standard deviation measured dispersion. Inferential statistics was then carried out using Pearson correlation and simple linear and multiple linear regression model were used to test hypothesis. The findings were presented using figures and tables. From the study, it was established that, most firms in electricity energy sub-sector do not share information with their trading partners, the electricity power sub-sector has a weak contract management practice, the actors have a moderate efficient and secured sources of collecting and analyzing the customers complains and providing feedback and most firms are faced with the problem of the quality of materials, inadequate skills and capacity. It was also established that the moderating effect of procurement regulations compliance gained variance in the performance of firms in electricity energy sub-sector in Kenya. The study concluded that, demand forecasting, strategic sourcing, supply chain risk management and contract management positively influences the performance of firms in electricity energy sub-sector. The study also concluded that compliance to purchasing regulations has a significance influence on the performance. The study therefore recommends the firms to collaborate and share information with other stakeholders, incorporate customers' needs in their strategic sourcing, create secured sources for collecting and collating customers complains, provide feedback and execute supply chain management practices within the legal framework. It also recommends the policy makers in the electricity energy sub-sector to have explicit standards and measures of performance between different stakeholders in their contracts. This would also prevent power outage which is experienced frequently. The study suggested strategies for addressing the identified challenges which could be potential avenues for future research in this field.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Supply chain management (SCM) is widely recognized as a strategic tool utilized by organizations to gain a competitive advantage over their competitors (Kyeremeh & Dza, 2018). According to The Council of Supply Chain Management Professionals (2018), the coordination and planning of all activities pertaining to sourcing including procurement, transformation, along with logistics management are widely regarded as the most critical aspect within an organization. The scope of this concept encompasses the strategic planning and efficient administration of various activities, spanning from procurement to logistics. Furthermore, it underscores the importance of cooperation and coordination among channel partners (Salvi, 2020). In the context of current commercial competition, organizations establish a linkage between their business activities and their supply chain counterparts, which include suppliers, distributors, wholesalers, retailers, and end consumers.

The main aim of this connection is to attain a reduction in costs and an increase in revenue (Petrovic & Arsovski, 2019). The existence of a managerial deficiency within these connections exerts a substantial impact on the entirety of the organization's supply chain network, thus underscoring the imperative need for the adoption of effective supply chain management (Bechtel & Jayaram, 2016). The impact of the supply chain is being observed in various economies, encompassing both well-established and emerging ones (Jingzi, Haitao, Hau & Song, 2013). The achievement of organizational growth is facilitated by pursuing it in conjunction with the objectives of the firm's supply chain strategy, as indicated by the study conducted by Barasa, Namusonge, and Iravo (2015). This phenomenon can be attributed to the congruence between the objectives and tactics of the organization and the management of the firm's supply chain management practices.

There has been considerable scholarly attention towards the examination of the influence of supply chain management practices on the performance of organizations

(Namusonge, Mukulu, & Iravo, 2017). Several scholars have placed emphasis on distinct objectives and characteristics of supply chain management practices (Botlhale, 2017). A study conducted by Govidan et al (2017) posits that supply chain management practices comprises various components, such as marketing, customer services, and finance. These features exhibit inter-organizational dynamics, emphasizing the importance of other organizations within the supply chain. The supply chain is comprised of multiple tiers that fulfill specific functions along the chain (Tortorella et al., 2017). The hierarchical arrangement of tiers operates as interlinked networks, thereby requiring the management of interactions and practices within the network.

1.1.1 Global Perspective of Supply Chain Management Practices and Performance of Firms in Electricity Energy Sub-sector

In response to the necessity of maintaining competitiveness, as well as various factors including the desire for cost-efficient offerings and services, elevated customer expectations, the globalized nature of markets, intense competition, environmental fluctuations, and the rapid pace of technological advancements, enterprises worldwide have come to recognize the significance of implementing a competitive supply chain management strategy as a means to sustain their presence in the market and enhance their operational effectiveness (Christopher, 2016). Habib (2016) asserts that the establishment of a successful supply chain necessitates the careful selection of highly competitive partners from various global regions by enterprises, in order to align with their specific requirements. Zeng, Tse, and Tang (2018) assert that numerous enterprises have adopted supply chain practices on a global scale, spanning various countries, regions, and cultures, with the aim of reducing costs, enhancing efficiency, and improving performance.

Supply chain management practices establish connections between suppliers and consumers, facilitating efficient control over the physical capital and information flows within the supply chain (Chopra & Meindl, 2015). The definition of Supply Chain Management (SCM) as provided by the Council of Supply Chain Management Professionals 2018 (CSCMPs) encompasses the comprehensive process of planning,

organizing, and coordinating all activities related to sourcing and procurement, transformation, logistics management, and fostering collaboration and coordination with network partners. According to Chopra and Meindl (2015), supply chain management (SCM) encompasses a range of practices and strategies that involve the collaboration of all stakeholders within the supply chain. The objective is to enhance the overall performance of both individual firms and the entire supply chain through the implementation of a cohesive and sustainable business model.

According to Frieman and Verhasselt (2012), achieving combined efficiency in the supply chain necessitates the collaboration of both internal and external partners. According to Alam et al (2012), it is argued that a successful supply chain should establish connections between network partners and their corresponding activities in order to maintain a consistent flow and achieve a balance between supply and demand. According to Christopher (2016), supply chain management (SCM) has become a prominent field for improving organizational performance. Kyeremeh and Dza (2018) as well as Mohdzain, White, and Ward (2012) assert that supply chain management (SCM) holds significant importance as a critical determinant for organizations to attain competitive advantage and improve overall organizational performance.

The implementation of Supply Chain Management practices encompasses a series of activities conducted within an organization with the aim of improving the efficient management of its supply chain (Li, 2016). Cuthbertson and Piotrowicz (2011) assert that supply chain management practices encompass a range of initiatives that have a significant impact on the entirety of the supply chain, including its constituent parts and key operational processes. According to Li (2016), the concept of supply chain management (SCM) encompasses various dimensions and include both the upstream and downstream aspects of the supply chain. The ultimate goal of SCM is to enhance organizational performance. In a study conducted by Zheng (2017), a comprehensive analysis was conducted to identify and categorize the various activities that firms can engage in when organizing and managing their supply chains. The nine categories that emerged from this research include healthy partnering, risks and benefits sharing, resources integration, information processing, knowledge capturing, social

coordination, strategic decision making, conflict resolution, and employees' motivation.

In order to achieve cost reduction and enhance performance, it is imperative for organizations to take into account supply chain practices at various levels within the supply chain (Nair, 2011). Heizer and Render (2017) assert that in order to optimize performance, manufacturers must engage in supply chain planning. This process facilitates the alignment of enterprise-wide manufacturing and distribution with enterprise-wide demand, thereby enabling collaborative forecasting. As a result, producers are able to compile the entire demand and centrally plan for the resources and production capacity required to meet it.

According to Tortorella et al. (2017), the electricity supply chain is regarded as a functional product characterized by an extended life cycle. It is observed that the implementation of Just in Time and KANBAN systems does not effectively optimize the operations of this supply chain. The system exhibits a substantial delivery volume, a consistent level of demand, and endeavors to minimize instances of power outages. The electricity supply chains consist of multiple tiers, encompassing generators, producers, suppliers to generators, transmitters, distributors, and end-consumers (Lukić et al., 2015). In the context of Uruguay, it is possible for a single organization to assume the roles of generator, transmitter, and distributor. The aforementioned model can be classified as a vertically integrated supply chain, as discussed by Gugler et al. (2017). In Brazil, the supply chain is characterized by a retailer-centric approach, wherein the generator occupies the second tier and the transmitter occupies the first tier. The upstream tiers play a crucial role in the planning, design, and strategic management of the entire electricity energy supply chain. Their primary objective is to meet the energy demand and minimize wastage (Gugler et al., 2017).

In the context of electricity supply chains, the occurrence of stock-outs is deemed unacceptable due to the inherent risks involved. Therefore, it is crucial to emphasize the significance of information sharing, as it fosters integration and synchronization of network practices, as well as the management thereof (Birhanu et al., 2014). The demand for electricity in the power market exhibits inelasticity, meaning that changes

in price have a limited impact on the quantity demanded. Additionally, electricity output cannot be stored (Aid et al., 2011). The synchronization of this distinctive characteristic necessitates efficient planning and collaboration, as mandated by government regulations, which can result in the elimination of power outages or the occurrence of only minimal, acceptable outages (Tortorella et al., 2017). It is imperative to establish robust monitoring mechanisms for electric power interruption in order to guarantee the effectiveness and risk mitigation of supply chains.

1.1.2 Regional Perspective of Supply Chain Management Practices and Performance of Firms in Electricity Energy Sub-sector

Africa is experiencing rapid economic growth and is increasingly being considered as a potential global sourcing hub for businesses (Katri, Asta & Weimu, 2017). The concept of supply chain management (SCM) has generated interest among organizations in numerous African countries (Manyathi, 2019). In 2005, South Africa implemented supply chain management (SCM) as a means to address governance, interpretation, and implementation issues pertaining to public procurement policies (Ambe, 2016). This adoption specifically focused on the management of the acquisition of goods, services, works, and other logistics within the public sector. Research has been conducted in Africa to examine the correlations between supply chain management practices and the performance, benefits, and challenges faced by organizations.

The majority of these studies indicate that an efficient supply chain management (SCM) is a significant tool in facilitating the attainment of cost advantage and more profitable outcomes for all stakeholders both within and outside an organization (Choi, Ram & Soo, 2012). An investigation into the field of humanitarian logistics: Enhancing assistance efforts. It has been determined that the responsibilities associated with logistics and supply chain management encompass a variety of tasks, such as strategic planning, procurement processes, efficient distribution, effective warehousing and inventory management, meticulous tracking and tracing, as well as the fulfillment of customers' orders (Agostinho, 2013). Bolsche (2013) asserts that the attainment of optimal logistics and supply service is contingent upon the provision of

punctual, secure, and dependable delivery. A study conducted by Mensah, Diyuon, and Oppong (2014) in Ghana examined the assessment of supply chain management practices and their impact on organizational performance. The findings revealed that the firm's effective implementation of supply chain management practices resulted in a continuous supply of raw materials.

As a result, the research findings revealed that both vendors and the organization had adopted an open book approach, actively seeking opportunities for product and cost enhancements. This strategic approach enabled them to offer products at competitive prices in comparison to their industry counterparts. In his study on contemporary supply chain management practices in Nigeria, Adebayo (2012) examines the impact of these practices on the field of supply chain management (SCM). The findings of the study indicate that manufacturing companies in Nigeria actively engage suppliers in the process of product design. This collaborative approach enables the companies to access cost-effective design alternatives, make informed decisions regarding the selection of components as well as technologies, and benefit from the suppliers' expertise in design evaluation. Research has also been conducted on the challenges of supply chain management (SCM) in the African context. An investigation conducted by Otchere, Annan, and Anin (2013) in Ghana examined the attainment of competitive advantage via integrating the supply chain in the cocoa industry. The study found that, similar to other business practices, supply chain management faces obstacles that arise from uncertainties or a lack of coordination among various activities and partners.

Arvis (2014) asserts that a prevalent challenge encountered by numerous countries in Sub-Saharan Africa pertains to the dearth of interconnectedness within supply chains along with global networks. According to Arvis (2014), the absence of transparency, visibility, and effective control within supply chains is a prevalent issue in numerous organizations across Africa. This lack of oversight results in prolonged lead-times and increased operational expenses. In a study conducted by Groznika and Trkman (2012) in South Africa, an examination of contemporary issues and challenges in supply chain management revealed that a significant issue among supply chain partners was the lack of effective information sharing. This deficiency resulted in the bullwhip effect, a phenomenon characterized by amplified fluctuations in demand as one moves up the

supply chain. Additionally, Buatsi (2014) asserts that supply chains in developing countries within Africa frequently suffer from inefficiency and ineffectiveness. This is primarily attributed to inadequate transport networks, insufficient means of transportation, a lack of appropriate warehouses equipped with necessary facilities, deficient IT infrastructure, and a scarcity of skilled personnel. Buatsi (2014) asserts that the presence of high levels of bureaucracy, corruption, unpredictable extreme weather conditions, and frequent power failures resulting from an unreliable electricity energy network contribute to the exacerbation of the situation.

1.1.3 National Perspective of Supply Chain Management Practices and Performance of Firms in Electricity Energy Sub-sector

In the Kenyan context, it has been recognized by prominent organizations that the adoption of supply chain management practices yields advantages such as improved product and service quality, cost reduction, and enhanced operational efficiency (Barua, 2010). Supply chain management (SCM) has been widely embraced by organizations worldwide due to its proven outcomes, including timely delivery, improved financial performance, increased customer satisfaction, and the establishment of trust and confidence among suppliers (Barasa, Namusonge & Iravo, 2015). According to the study conducted by Achieng' and Rotich (2013), the implementation of a robust supply chain system within an organization is crucial in ensuring the reliable, streamlined, and economically viable movement of materials, services, and works.

According to Kimechwa, Njeru, and Makau (2015), the implementation of supply chain management practices (SCMPs) such as outsourcing goods and services, effective utilization of information and communication technology, strategic partnerships, and globalization can result in cost reductions, increased profitability, improved efficiency, and a larger market share for organizations. On the other hand, Watiri and Kihara (2017) argue that SCMPs such as strategic partnerships and maintaining positive customer relationships have a significant impact on organizational performance. According to Mutuerandu and Iravo (2014), the implementation of effective Supply Chain Management Practices (SCMPs) has been

found to have a favorable impact on the overall performance of organizations. According to a report by the World Bank (2013) on procurement under IBRD loans and IDA credits, it has been observed that many institutions in Kenya have faced persistent challenges in supplier management. These challenges primarily stem from a lack of trust and commitment in the existing relationship, leading to reported cases of malpractices.

According to the study conducted by Achieng' and Rotich (2013), it is recommended that parties involved in a supply relationship should refrain from adopting a win-lose mentality and confrontational approach in order to foster a positive and mutually beneficial relationship. The level of service delivery, efficiency, and effectiveness of supply chain management can be negatively impacted by a lack of commitment and trust among the actors within the supply chain (Omondi, Ombui & Mungatu, 2013). Omondi et al. (2013) assert that the exchange of information among organizations in Kenya is constrained by a bureaucratic framework and a heavy dependence on manual modes of communication. This situation has had a detrimental impact on the performance of supply chain management, as it leads to delays in the transmission of information between different entities.

The electricity energy supply chain comprises five primary functional areas, namely the sources for the supply of primary fuel, generation, transmission, distribution, and supply to the end-user (Seth & Scott, 2013). Regulatory bodies play a crucial role in offering operational guidance. The electricity energy supply chain in Kenya encompasses various activities related to power sourcing. One of the sources of power in this chain is the Geothermal Development Company (GDC), which was established by the Kenyan government in 2008 with the aim of expediting the development of geothermal energy (GDC, 2009). The GDC is responsible for conducting high-risk activities related to the exploration and development of geothermal fields. These activities encompass various stages such as exploration, evaluation, production, drilling, and the management of established steam fields (USAID, 2015).

The entity is responsible for engaging in Steam Sales Contracts with various stakeholders in the electricity energy supply chain, such as KenGen and Independent

Power Producers (IPPs) (GoK, 2013). The process of power production, involving the conversion of different primary fuels for electricity generation, is carried out by Kenya Generating Company Limited (KenGen) and Independent Power Producers (IPPs) (Ministry of Energy, 2011). Companies establish steam sales agreements with the Geothermal Development Company (GoK, 2013) in order to enhance their electricity generation capabilities by utilizing energy derived from geothermal wells. Additionally, these companies procure various primary fuels, including coal, oil, wind, hydro, thermal, and gas, for the purpose of electricity generation (IEA, 2015).

The responsibilities of transmission and distribution functions are carried out by two primary entities. The Kenya Electricity Transmission Company Limited (KETRACO) and the Kenya Power Company Limited (IEA, 2015) are two prominent entities in the Kenyan electricity sector. KETRACO is responsible for the design, construction, ownership, operation, and maintenance of new high voltage electricity transmission infrastructure. This infrastructure serves as the fundamental framework of the National Transmission Grid, aligning with Kenya's Vision 2030 as outlined by KETRACO in 2013. The Ministry of Energy (MoE, 2012) is responsible for overseeing the development of the national transmission grid network and facilitating regional power trade via its transmission network.

Distribution is the final component of the electricity energy supply chain. This process entails extracting electrical energy from the transmission system and distributing it to residential and commercial end-users at the location of consumption. According to the EPRA (2009), the distribution of power in Kenya is the responsibility of the Kenya Power Company. The entity assumes the responsibility of procuring electricity in large quantities from KenGen and IPPs, either through mutual agreements or via Power Purchase Agreements (PPAs) that have been duly approved by the Energy and Petroleum Regulatory Authority (EPRA). The Kenya Power Company is responsible for the transmission, supply, and retail of electricity power (MoE, 2012).

The provision and administration of an electricity energy service encompass a range of tasks, including but not limited to predicting future demand, strategizing for the acquisition and allocation of materials, extracting and refining new energy sources,

procuring necessary resources, overseeing inventory management, implementing effective information systems, mitigating risks, ensuring quality control, scheduling production and generation, maintaining a stock of spare parts, conducting maintenance activities, managing distribution and transportation, handling reverse logistics, managing waste disposal, overseeing contract agreements, and providing customer service (Heizer & Render, 2017). The interconnections among individuals involved in executing these activities have a significant impact on their relationships and mutual performance.

In order to optimize performance in the electricity energy sub-sector, it is imperative that all stakeholders collaborate and operate cohesively as a unified entity. According to Habib (2014), the likelihood of success in managing the flow of information or materials across the supply chain is high when effective supply chain practices are established as a foundation. According to Wijetunge (2016), establishing a connection between supply chain objectives and company strategy can facilitate the making of informed decisions when faced with competing demands on the supply chain. The implementation of cost-minimization strategies in organizations involves various approaches, including volume purchasing, the establishment of pre-qualified vendors, and the determination of appropriate re-order levels. These strategies aim to maintain low inventory levels while ensuring the smooth functioning of operations. It is important to note that the adoption of these strategies is guided by regulatory frameworks (Magutu, Mbeche, Njihia, & Nyaoga, 2016).

Mutai and Chirchir (2015) assert that the purpose of adhering to procurement regulations is to enhance the efficiency of operational supply chain performance, ensuring the timely delivery of products or services to the end customer while minimizing costs. Given the increasing emphasis on supply chain management (SCM) practices, researchers have made efforts to understand the correlation between SCM practices and organizational performance. Nevertheless, there have been conflicting results due to differences in how metrics related to organizational performance are defined and measured (Karimi & Refiee, 2014). Several studies have utilized a range of supply chain management (SCM) practices to examine the relationship between SCM practices and organizational performance.

In their study, Hamid and Ibrahim (2014) delineated the components of supply chain management (SCM) practices as encompassing buyer-supplier partnership, outsourcing, cycle time reduction, continuous process flow, and information technology sharing. In their study, Tan et al. (2002) identified six key components of supply chain management (SCM) practices. These components encompassed supply chain integration, information sharing, supply chain attributes, customer service management, geographical proximity, and just-in-time (JIT) capability. The concept of supply chain management (SCM) practices was identified by Min and Menzer (2004). These practices encompass various elements such as agreed vision along with goals, sharing of information, risk as well as award sharing, cooperation, workflow integration, long-term relationships, and agreed supply chain leadership.

In their study, Mutuerandu and Iravo (2014) employed strategic supplier partnership, relationship with customers, information sharing, and training practices as the primary indicators of supply chain management (SCM) practices. On the other hand, Watiri and Kihara (2017) examined the impact of SCM practices on competitive advantage in the cement manufacturing industry. They focused on strategic supplier partnership, which was measured through product design, the marketplace forecast technology sharing, and joint inventory management. Additionally, customer relationship was assessed using customer loyalty, customer complaints, customer satisfaction, and responsiveness as measures. The competitiveness of the subjects was assessed by the researchers through the utilization of market share, product quality, and cost leadership as metrics. Barasa, Namusonge, and Iravo (2015) have identified several supply chain management (SCM) practices that have an impact on organizational performance. These practices include collaboration in the supply chain, sustainable supply chain management, sharing of knowledge, and customer relationship management.

In a study conducted by Kimemia and Moronge (2018) on the determinants of collaborative procurement practices in the energy sector in Kenya, specifically focusing on the Kenya Electricity Transmission Company Limited, various factors were examined. These factors included policy framework, budgetary allocation, leadership strategy, communication/knowledge sharing, technology alignment, and stakeholder involvement. The study revealed that among these procurement practices,

the policy framework exhibited the most significant influence. In this study, the key dimensions of supply chain management (SCM) practices and performance were demand forecasting, strategic sourcing strategy, supply chain risk management and contract management. These dimensions were examined in relation to procurement regulations compliance as the moderating effect.

1.2 Statement of the Problem

Growth in population along with economic activities are significant factors that contribute to the increase in energy demand. The anticipated demographic shift in Africa is expected to sustain the upward trajectory of energy service demand in the region over the next few decades. The primary objective of the United Nations Sustainable Development Goal 7 (SDG7) is to guarantee universal access to affordable, reliable, sustainable, and modern energy. The Energy Policy of Kenya aims to achieve the provision of reliable and affordable electricity to both businesses and households across the country (Government of Kenya, 2019). Based on the findings of the Kenya National Bureau of Statistics (KNBS) (2021), there was a 3.9% rise in the overall electricity demand in 2019, accompanied by a 6.9% increase in the production of electricity within the same timeframe.

Kamband and Mshana (2021), observed that sales to large and medium commercial customers experienced a decline of 3.6 percent in the year 2020. This decline raises concerns regarding the potential consequences of the current generation investments, which may lead to a surplus of power. Such a surplus could pose financial difficulties for Kenya Power or necessitate an increase in electricity tariffs. Consequently, this could negatively impact the cost of operations in the firms. Therefore, it is imperative to establish a synchronization between supply and demand by adopting a reliable demand forecasting system.

According to the Medium Term Plan III (2018-2022), the cost of electricity energy in Kenya is significantly elevated. The average cost of household power in the United States is approximately $0.22 per kilowatt-hour (KWh), while in Uganda it is $0.19 and in Ethiopia it is $0.01. A report by the Kenya National Bureau of Statistics (KNBS) in 2021, revealed that the total amount of transmission and distributive losses in the

electricity sector reached 2,790.7 GWh in the year 2020. This figure represents approximately 24.3 percent of the overall electricity supply during that period. The losses incurred were ascribed to substandard equipment, inadequate metering, and instances of employees' unethical behavior among other factors. This therefore, calls for sourcing strategically and putting measures in place to ensure that goods or services sourced meet the set standards.

The prevalence of unreliable power in Kenya remains a significant concern. In the year 2020, the System Average Interruption Frequency Index (SAIFI) was recorded at 2.13 hours, while the Customer Average Interruption Duration Index (CAIDI) was measured at 4.6 hours. These values fell short of the international best practices, which recommend values of less than 1 hour for SAIFI and 2.5 hours for CAIDI (EPRA, 2021). An analysis of the electricity sector in Kenya, focusing on the country's priority plan and diagnostic, conducted by Kamband and Mshana (2021) identified deficiencies in the procurement of dependable contractors and the management of contracts within the electricity sector, being among the factors frequenting occurrences of power outages.

According to Okanda, Namusonge, and Waiganjo (2016), the implementation of an efficient contract management function has the potential to enhance procurement performance, ensure adherence to contractual obligations, allow contract management teams to contribute value to the procurement function, and effectively manage organizational risks. According to Chepngetich, Waiganjo, and Karani (2016), the implementation of contract management practices facilitates the achievement of predetermined objectives within the allocated budget and specified timeframe.

1.3 Research Objectives

1.3.1 General Objective

The general objective of the study was to assess the influence of supply chain management practices on performance of firms in the electricity energy sub-sector in Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives:

1. To determine the influence of demand forecasting on the performance of firms in electricity energy sub-sector in Kenya.
2. To establish the influence of strategic sourcing on performance of firms in the electricity energy sub-sector in Kenya.
3. To examine the influence of supply chain risk management on performance of firms in the electricity energy sub-sector in Kenya.
4. To evaluate the influence of contract management on performance of firms in the electricity energy sub-sector in Kenya.
5. To explore the moderating effect of procurement regulations compliance on the relationship between supply chain management practices and performance of firms in the electricity energy sub-sector in Kenya.

1.4 Research Hypotheses

The study was guided by the following research null hypotheses:

H_{01}: Demand Forecasting has no significant influence on the performance of firms in electricity energy sub-sector in Kenya

H_{02}: Strategic Sourcing has no significant influence on performance of firms in the electricity energy sub-sector in Kenya

H_{03}: Supply Chain Risk Management has no significant influence on performance of the firms in electricity energy sub-sector in Kenya

H_{04}: Contract Management has no significant influence on performance of firms in the electricity energy sub-sector in Kenya

H_{05}: Procurement Regulations Compliance has no significant moderating effect on the relationship between supply chain management practices and performance of firms in the electricity energy sub-sector in Kenya.

1.5 Significance of the Study

The study will benefit the following stakeholders:

1.5.1 Management team in electricity energy sub-sector in Kenya

The electricity energy sub-sector plays a pivotal role in facilitating and propelling economic growth. Industries are heavily dependent on energy as a vital input, and the effective dissemination of electricity within the energy sub-sector plays a pivotal role in facilitating broader access to power for individuals. Consequently, this phenomenon results in a decrease in instances of power interruptions, thereby enhancing the operational efficiency of businesses and granting them greater autonomy in their transactions.

1.5.2 Policy Makers

This study has the potential to provide valuable insights to government entities regarding the importance of conducting a thorough evaluation of sourcing options before making a final decision. By doing so, both the procuring entity and the general public can reap the benefits that are associated with such a strategic approach. The guidance provided by this research could prove highly advantageous to policy makers at the Ministry of Energy in formulating policies pertaining to the electricity energy sub-sector. The implications of the study are also pertinent to firms operating in the electricity energy sub-sector, as they make decisions regarding the activities of various stakeholders.

1.5.3 Research Institutions

The results of this study have the potential to serve as a foundation for future investigations in the field, offering a comprehensive analysis of the subject matter. This resource can serve as a valuable point of reference for researchers in the same field, thereby facilitating their studies. The study provided recommendations regarding supply chain management practices and firm performance within the electricity energy sub-sector in Kenya. It also suggested strategies for addressing the identified challenges and proposed potential avenues for future research in this field.

1.6 Scope of the Study

The present study investigated the primary providers of electricity, encompassing both public and commercial entities engaged in power generation, that were active during the period spanning from 2013 to 2017. These providers were connected to the power grid, electricity transmission networks, as well as distribution institutions. The institutions being evaluated have established a long-lasting and resilient relationship. The study involved the personnel employed in various departments of the chosen organization, such as procurement, distribution, logistics, warehousing, research and development, and finance. The selection of these individuals was based on the anticipation that they would possess the requisite knowledge pertaining to supply chain management practices. The selected institutions are located in Nairobi, Mombasa, Naivasha, Mumias, Meru, and Thika. The study was limited in its focus to the analysis of specific factors, namely demand forecasting, strategic sourcing, supply chain risk management, contract management practices, and the moderating variable that was compliance with procurement legislation.

1.7 Limitations of the Study

One significant limitation experienced during the course of the study was the unfavorable reception of the researcher by specific participants, which can be attributed to the sensitive nature of the research subject. As a consequence, there were difficulties encountered in the process of gathering data within particular office environments. The management successfully resolved this matter by delivering a thorough elucidation to the participants regarding the significance of the research to the organization. The respondents demonstrated a significant propensity to fully engage with the survey as a result of apprehensions regarding the potential exposure of confidential data. The participants were given reassurance by the researcher through explicit communication that the data collected would be used exclusively for academic purposes. Furthermore, it is important to note that the study was conducted with the appropriate authorization from the National Commission for Science, Technology, and Innovation (NACOSTI), as highlighted by the researcher. The acquisition of data from the University was officially sanctioned through a formal letter of authorization. A

subset of the participants experienced delays in their response time, whereas another subset encountered challenges in locating the questionnaire. To address the issue at hand, a decision was made to allocate extra time and replace the questionnaires that were mistakenly placed. Customer survey reports were unavailable for analysis.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter discusses the theoretical framework, conceptual framework, description of variables, empirical review, critique of existing literature, research gap and the summary.

2.2 Theoretical Framework

This section discusses the theories explaining supply chain management practices and the performance of firms in electricity energy sub-sector. The theories underpinning this study therefore include; the systems theory, strategic choice theory, network theory, relational contract theory and the supply chain operations reference model.

2.2.1 The Systems Theory

The Systems Theory was originally formulated in 1936 by Ludwig von Bertalanffy, an Austrian biologist. Initially rooted in the natural sciences, the concept has permeated various domains, including organizations and management theory, serving as a means to elucidate processes occurring within and among said organizations. The theoretical framework posits that it is not appropriate to conceptualize systems, such as supply networks, as a collection of individual components. The central emphasis of the theory lies in the examination of the interconnections and subsequent organization among the various constituents within a given system. The establishment of relationships plays a crucial role in the understanding of systems, as it contributes to the formation of a cohesive entity and aids in the achievement of a shared and overarching objective (Desouza, Chattaraj, & Kraft, 2003).

According to Gregson (2007), a system is not just one particular phenomenon but rather the entire pattern of phenomena that provide the surroundings and condition of being for a particular process. Jones and Riley (1985) propose that business networks can be categorized as either open or closed systems. The supply network, when viewed

holistically, can be considered a closed system and therefore necessitates comprehensive integration and management. According to Gregson (2007), decisions that are considered ideal cannot be solely based on individual roles due to the intricate interdependencies that exist between these roles, as grounded in the system concepts but should prioritize the ultimate outcome rather than focusing on individual occurrences throughout the process.

Jones and Riley (1985), Houlihan (1985), and Novack and Simco (1991) asserts that, there exists a seamless sequence of operational domains within organizations which facilitate the movement of materials and related information from suppliers of raw materials to distributors who interact with end customers. The primary objective of this interconnected network is to enhance the efficiency of the supply chain. The significance of system-wide coordination of materials and information flows has been underscored by Lee and Billington (1992) as well as Christopher (2011). According to Sanderson, Lonsdale, and Mannion (2015), the act of sharing information among businesses within the supply chain serves as a crucial method for indicating a commitment to fostering continuous collaborative behavior. According to Lee and Billington (1992), the management of supply chains should be approached holistically in order to enhance cost efficiency, as well as the effectiveness of services and quality. In his seminal work on the analysis of firms and their supply chains, Forrester (1961) identified a phenomenon known as the bullwhip effect. This effect arises as a result of distorted demand information that is transmitted from buyers to suppliers within firms that are managed independently along the supply chain. Consequently, this distortion leads to the unintended consequences of overproduction and the accumulation of excessive inventory.

The management of a supply chain as a system necessitates the establishment of cooperation, collaboration, information sharing, trust, partnerships, shared technology, and a fundamental shift from the management of individual functional processes to the management of interconnected chains of processes (Power, 2005). According to Kwon and Suh (2005), supply chain integration is regarded as a strategic mechanism that seeks to minimize expenses, consequently enhancing the value for both customers and shareholders. According to Narasimhan, Jayaram, and Carter (2001), adopting a

comprehensive approach to supply chain integration can be an effective strategy for enhancing business performance within a fiercely competitive market. According to Frohlich and Westbrook (2001), there exists a strong positive correlation between an organization's performance and its highest levels of integration with both suppliers and customers.

The primary obstacle in achieving supply chain integration lies in the coordination of activities throughout the entire supply chain (Mogaka, 2023). This coordination is crucial for enterprises to enhance their performance by minimizing costs, enhancing service levels, mitigating the bullwhip effect, optimizing resource utilization, and effectively adapting to market fluctuations (Simchi-Levi *et al.*, 2009). According to Chopra and Meindl (2015), supply chain coordination is achieved when all stages within the supply chain collaborate to optimize overall supply chain profitability, rather than focusing solely on individual stage profitability. In the electricity energy sub-sector supply chain, it is imperative for firms engaged in various functions to operate cohesively as a unified system in order to attain both profitability and customer satisfaction. The theory can be applied to all four variables.

2.2.2 Strategic Choice Theory

The development and advancement of Strategic Choice Theory (SCT) can be attributed to Child in 1972. According to the aforementioned theory, the primary objective of organizations is to attain elevated levels of performance and enhance efficiency within the confines of economic limitations. In order to achieve optimal performance, firms operating within the electricity energy sub-sector must place significant importance on contextual factors. In the market, managers who, for example, adopt contemporary technology to assess suppliers and make wise decisions for their companies are likely to do well. The impact of strategic decisions within companies on the organizational results is substantial. Child (1972) presented a foundational article that established a theoretical basis for the examination of strategic choice.

According to Child's perspective, strategic choice theory places less emphasis on the functional operations of an organization and instead focuses more on the system of

governance as well as political activities within organizations. Hence, it is imperative for managers to implement structural reforms, control environmental factors, and select appropriate performance benchmarks in order to effectively attain organizational objectives with regards to supplier sourcing. Based on the Social Cognitive Theory (SCT), managers assume a crucial role in attaining organizational outcomes by means of their decision-making abilities and their capacity to lead organizational changes (Child, 1972; Ketchen & Hult, 2007).

According to Kochan, Katz, and McKersie (1986), the strategic decision-making process encompasses three distinct levels: the top tier, which involves long-term planning; the middle tier, which focuses on tactical decision-making; and the bottom tier, which pertains to decision-making at the functional level. According to the perspective of strategic choice theory, managers are perceived as proactive agents who play a crucial role in making downstream decisions and primarily concentrate on guiding significant organizational decisions and change processes. According to Child (1972), organizational change, referred to as "variation in organizational structure," is influenced by three situational factors: the environment, technological advances, and organizational size. This theory is applicable to the present study as it provides support for the implementation of strategic sourcing. Specifically, it highlights the significant role that managers of firms operating in the electricity energy sub-sector play in driving company results through their decision-making processes.

It is imperative for managers to cultivate an enduring dedication to communication along with collaboration at various levels within and between organizations. This entails involving personnel from diverse departments and supply chain members in strategic planning, as well as establishing reliable suppliers for the organization. Therefore, it is imperative for managers within the electricity energy sub-sector to cultivate strong relationships with suppliers and possess the ability to make well-informed decisions. According to Carla *et al.* (2014), the implementation of strategic sourcing has the potential to optimize the design, configuration, or re-engineering of the supply chain. This optimization aims to minimize complexity and improve the alignment of flows within the supply chain.

2.2.3 Network Theory

The Network Theory encompasses the examination of the interconnected relationships among various entities, such as companies, suppliers, customers, or buyers. The cited study by Harland (1996) demonstrates the manner in which companies within a supply network engage in reciprocal processes to align their operations and systems, fostering the development of trust and confidence in inter-organizational relationships over a period of time. According to Chang, Chiang, and Pai (2012), the supply chain network can be characterized as a complex network model, with its specific configuration being contingent upon the interrelationships among the various members of the network. The precise origins of the network theory remain unclear in terms of its initial introduction. According to Hakansson and Ford (2002), the topic of NT continued to be a significant subject of research discourse throughout the 1970s and 1980s.

The success of a company is contingent upon its ability to effectively collaborate with its immediate counterparts, as well as the extent to which these counterparts are able to collaborate with their own network of business partners (Oliver, 1990). Supply chain networks are widely recognized as advantageous for all companies involved, as evidenced by the investments and actions of the various counterparts participating in the procedure (Haakansson & Snehota, 1995; Haakansson, 1987). The utilization of Network Theory (NT) can serve as a foundational framework for conducting conceptual analyses of decision-making processes within supply chain networks that involve cooperative relationships. The establishment of strategic long-term partnerships simplifies resource allocation and becomes a significant factor in demand planning for a firm's continuous interaction with other players.

According to Haakansson and Ford (2002), the establishment of relationships allows firms to access a wider range of suppliers, thereby ensuring a consistent supply of essential commodities. The assumption of trustworthiness in the relationships between companies contributes to value creation for both parties involved. This, in turn, simplifies the decision-making process regarding the selection of a supply strategy and facilitates effective negotiation. Companies in networks strive to establish long-term contracts that foster strong partnerships among the involved parties (Harland, 1996).

The application of network theory (NT) significantly enhances comprehension of the intricacies involved in inter-organizational dynamics within supply chains.

Harland (1996) identifies various activities that are deemed significant within a network. The activities encompassed in this context involve the careful choice of collaborative stakeholders and the creation of an edge over others, the diligent surveillance of competitors, and the effective management of relationships. The concept of openness and trust is presented by NT as a prerequisite for achieving optimal outcomes through collaborative efforts. According to Shook et al. (2009), the use of network theory (NT) appears to offer guidance to companies in selecting suppliers or strategic alliance partners. However, the study concludes that NT does not expressly provide companies with guidance on when to decide between internal production (make), external procurement (buy), or forming alliances.

Because companies in a network are interconnected, there is a high level of information sharing between counterparts. According to Samaddar, Nargundkar, and Daley (2006), the exchange of information among network members enables firms to enhance the precision of demand forecasts, thereby leading to improved operational efficiency. The relationships established through direct communication exhibit a distinctiveness that ultimately leads to the customization of supply chains in order to fulfill the specific requirements of individual customers. According to Gadde and Haakansson (2001), trust between parties is developed over time through social exchange processes.

The establishment of strong inter-firm relationships within a network is also a significant factor in fostering the acquisition of novel competencies, the preservation of valuable resources, and the distribution of risks. During the course of conducting business operations, companies engage in negotiations and establish contractual agreements with suppliers. The parameters of the collaboration have been clearly delineated and formal agreements have been executed. Various categories of contracts can be identified, including fixed-price contracts, long-term contracts, and short-term contracts (Schiele, 2006; VanWeele, 2005). Companies that are part of a network frequently establish enduring contractual agreements with their suppliers. Therefore,

it is imperative to establish a reliable and credible relationship that facilitates the mutual exchange of value between both parties involved in the relationship. The network does not strive for an optimum equilibrium, but rather exists in a perpetual state of dynamism and transformation.

According to Johanson and Mattsson (1987), the gradual process of mutual adjustments leads to enhancements in administrative as well as logistical systems, resulting in increased efficiency. Through sustained and collaborative partnership, the involved parties can cultivate a shared and robust foundation of trust, potentially leading to the obsolescence of costly contractual safeguards. Therefore, companies that possess effective and collaborative arrangements may obtain a competitive edge over companies that incur transaction costs in order to mitigate the risk of opportunistic behavior from their business partners. This theory can be applied to the contact management practices of firms in the electricity energy sub-sector supply chain, particularly in situations where trust plays a crucial role, such as when entering into steam sales as well as power purchase agreements with power actors. Trust can also be utilized to provide solutions for monitoring the contract process, as it can function as a governance instrument in hybrid organizations, alongside price in the market along with authority in the hierarchical structure (Bradach & Eccles, 1989). The theory can also be applied to demand projections, sourcing strategies, as well as management of risks.

2.2.4 Relational Contract Theory

The premise of relational contract theory encompasses a legal and economic perspective that perceives contracts not merely as isolated transactions, but rather as interconnected relationships (Macneil, 1987). The development of this concept took place under the guidance of Ian Macneil, a distinguished professor of law at Northwestern University. The conventional framework of contract theory centers on the explicit provisions of a contractual agreement and the legal recourse that can be pursued in the event of a breach by either party (Mouzas & Blois, 2008). In contrast, relational contract theory acknowledges that contracts frequently exist within the context of enduring relationships between the involved parties. The dynamics of these

relationships are regulated by a range of implicit norms and understandings, in addition to the explicit provisions outlined in the contract (McLaughlin, McLaughlin & Elaydi, 2014).

Relational contract theory places significant emphasis on the significance of good faith and equitable treatment within contractual relationships (Harper & Molenaar, 2014). It is important to acknowledge that parties involved in a relational contract frequently share a mutual interest in collaborating to attain their shared objectives. This could potentially prompt individuals to modify the terms of their contract gradually in order to accommodate evolving circumstances (Nwajei, 2021). Relational contract theory holds particular relevance in the context of intricate contractual arrangements, such as those pertaining to long-term supply agreements, employment contracts, and franchise agreements (Diathesopoulos, 2012).

In the context of such contractual agreements, it frequently proves challenging to foresee all potential contingencies that may emerge throughout the duration of the association (Harper, 2014). Consequently, the involved parties are compelled to depend on one another's trustworthiness and collaborative efforts in order to effectively address and settle any potential conflicts. Relational contract theory holds particular relevance in contexts where trust, repeated interactions, and collaboration play crucial roles, as observed in domains such as supply chain management, joint ventures, and strategic partnerships (Bertelli & Smith, 2010). Through the cultivation of trust and the prioritization of cooperation, entities involved in relational contracts can attain enduring reciprocal advantages and effectively respond to evolving market dynamics (Jagtap & Kamble, 2020).

However, it is imperative to emphasize the significance of efficient contract management and communication in order to guarantee the fulfillment of expectations and objectives for both parties involved (Liu *et al.*, 2020). According to Macneil, the conventional framework of contract law exhibited an excessive emphasis on the explicit provisions of contracts, while neglecting to sufficiently consider the implicit terms and understandings that frequently play a crucial role in the development of enduring relationships (Brahm & Tarzijan, 2016). Furthermore, he contended that

conventional contract law exhibited an excessive emphasis on rigid regulations and protocols, thereby failing to sufficiently acknowledge the significance of trust and cooperation within relational contracts (Wallenburg & Schäffler, 2014).

Relational contracts hold significance due to their ability to facilitate enduring partnerships that yield mutual advantages for involved parties (Dekker, Sakaguchi & Kawai, 2013). Furthermore, they enable parties to effectively respond to evolving circumstances without necessitating the need for frequent contract renegotiations. The field of RCT acknowledges that contracts frequently exhibit complexity and incompleteness, and emphasizes that the parties' relationship holds greater significance than the precise provisions outlined within the contract (Bondareva & Pinker, 2019). Furthermore, it underscores the significance of acting in good faith and fostering cooperation among the involved parties. Randomized controlled trials (RCTs) are particularly applicable to contracts that have a long-term duration or involve ongoing relationships, such as employment contracts, supply contracts, and franchise agreements (Gil, 2009).

In contracts of this nature, it is probable that the involved parties will engage in continuous communication and collaboration, necessitating potential adjustments to the contract's specific provisions as circumstances evolve (Tunca & Zenios, 2006). RCT has a number of implications for contract law and practice. For instance, it proposes that judicial bodies ought to exhibit greater readiness in upholding implicit provisions and understandings within contractual agreements, even in the absence of explicit written documentation (Macchiavello, 2022). Additionally, it is proposed that courts should exhibit greater adaptability in their approach to addressing breaches of contract, while also considering the enduring nature of the relationship between the involved parties (Ferrer, Santa, Hyland & Bretherton, 2010).

The integration of relational contract theory and contract management practice can yield a synergistic approach to efficiently overseeing supply chain operations (Jevremović, 2022). Relational contract theory places significant emphasis on the establishment and cultivation of enduring, mutually advantageous relationships with suppliers. This phenomenon has the potential to enhance communication,

coordination, and collaboration across the entire supply chain (Höhn & Höhn, 2010). The practice of contract management encompasses the establishment, negotiation, and administration of contractual agreements. The utilization of this tool serves the purpose of guaranteeing that contracts possess clarity, comprehensiveness, and enforceability (Argyres, Bercovitz & Zanarone, 2020).

Additionally, it has the capability to oversee and administer contract performance, as well as to address and resolve any potential disputes that may emerge (Bernstein, 2015). The application of relational contract theory is of considerable importance in the field of contract management, particularly in the realm of supply chain operations (Gibbons & Henderson, 2012). The concept aids in facilitating the progress and administration of enduring associations among entities, suppliers, and additional stakeholders engaged in the supply chain (Ke, Gajendran & Davis, 2015). The interconnection between relational contract theory and contract management practice in the management of supply chain operations is significant.

Relational contract theory places significant emphasis on the significance of enduring relationships between buyers and suppliers, whereas contract management practice pertains to the systematic endeavor of ensuring the efficient and effective execution of contracts (Höhn, 2009). The utilization of relational contract theory holds significant potential in effectively managing supply chain operations. Developing robust relationships with suppliers and customers can prove advantageous for businesses, as it has the potential to enhance operational effectiveness, curtail expenses, and augment profitability (Grafton & Mundy, 2017). Relational contract theory is deemed to be a valuable instrument for effectively managing supply chain operations in a comprehensive manner. Businesses can cultivate robust relationships with their suppliers and customers by prioritizing the connection, demonstrating flexibility and adaptability, maintaining regular and transparent communication, and upholding principles of fairness and honesty (Andrews & Barron, 2016). This phenomenon can result in various advantages, such as enhanced operational effectiveness, decreased expenditures, heightened financial gains, and diminished exposure to risk.

2.2.5 Supply Chain Operations Reference (SCOR) Model

The Supply Chain Operations Reference (SCOR) Model is an organizational model that was developed by the Supply Chain Council, which is now a part of the Association for Supply Chain Management (Li, Su & Chen, 2011). Its purpose was to establish a standard and enhance the management and performance of supply chains. The model is extensively utilized and embraced within organizations as a comprehensive framework for evaluating, comparing, and enhancing their supply chain operations (Delipinar & Kocaoglu, 2016). The SCOR Model offers a standardized framework for the description, analysis, and enhancement of supply chain processes, facilitating effective communication and systematic evaluation (Ganji *et al.*, 2015).

The SCOR Model holds significant value for organizations operating in diverse industries seeking to enhance their supply chain performance (Dissanayake & Cross, 2018). The framework offers a systematic methodology for evaluating and enhancing supply chain operations, ensuring that supply chain strategies are in line with organizational objectives, and attaining improved operational effectiveness, adaptability, and competitive advantage (Ntabe *et al.*, 2015). Through the utilization of the SCOR Model, organizations can enhance their comprehension of supply chain operations, discern opportunities for enhancement, and evaluate their performance in relation to industry benchmarks and optimal methodologies (Sellitto *et al.*, 2015). This phenomenon has the potential to result in heightened efficacy within the supply chain, diminished expenditures, enhanced customer satisfaction, and increased competitiveness within the broader market.

The Supply-Chain Council has developed and endorsed a process reference model that serves as a widely accepted standard diagnostic tool for supply chain management across various industries (Hwang *et al.*, 2014). The SCOR model delineates the various business activities involved in meeting a customer's demand, encompassing planning, sourcing, manufacturing, delivering, returning, and enabling (Rezaei *et al.*, 2018). The utilization of the model encompasses the examination of the present condition of a company's processes and objectives, the quantification of operational performance,

and the comparison of company performance to benchmark data (Wibowo & Sholeh, 2017). The Supply Chain Operations Reference (SCOR) Model is a process reference model that was developed by the Supply-Chain Council with the aim of assisting organizations in standardizing, measuring, and enhancing their supply chain processes (Moharamkhani *et al.,* 2017).

The SCOR Model is a versatile framework that can be applied by organizations of varying sizes and across diverse industries (Ayyildiz & Taskin-Gumus, 2021). The SCOR Model comprises five fundamental processes, namely planning, sourcing, manufacturing, delivering, and returning (Prasetyaningsih, Muhamad & Amolina, 2020). The Plan process encompasses the formulation and sustenance of a strategic plan for the supply chain. This encompasses the process of recognizing customer requirements, predicting market demand, and formulating strategies for production and distribution. The procurement process entails acquiring the necessary goods and services to fulfill customer demand. This encompasses the processes of supplier identification and selection, contract negotiation, and order placement.

The process of Make entails the conversion of primary materials and constituent parts into finalized goods (Nguyen *et al.,* 2021). This encompasses the activities of production planning, scheduling, and execution. The process of delivery encompasses the transportation of completed products to customers (Lemghari, Okar & Sarsri, 2018). This encompasses the functions of warehousing, transportation, and order fulfillment. The Return process encompasses the systematic management of product returns initiated by customers (Kusrini, Rifai & Miranda, 2019). The tasks encompassed in this process involve the reception, examination, and handling of products that have been returned.

Every primary process is subsequently subdivided into sub-processes, and each sub-process is further subdivided into activities (Ikasari, Sutopo & Zakaria, 2020). The SCOR Model encompasses a collection of metrics that facilitate the evaluation of performance for every process, sub-process, and activity (Mogaka, 2023). The SCOR model possesses the capability to serve a multitude of purposes (Rodríguez-Mañay *et al.,* 2022). The SCOR model is a valuable tool for the identification of areas within

supply chain processes that have potential for improvement (Jain *et al.,* 2022). The SCOR model serves as a valuable tool for assessing and benchmarking a company's supply chain performance against that of other companies operating within the same industry (Ikatrinasari, Harianto & Yuslistyari, 2020). The utilization of the SCOR model has the potential to enhance interdepartmental communication and collaboration within an organization.

The SCOR model possesses the capability to facilitate the design of a novel supply chain or the reconfiguration of an already established supply chain (Alshawabkeh *et al.,* 2022). The utilization of the SCOR model is deemed advantageous for enterprises seeking to enhance their capabilities in supply chain management (Fauziyah, Ridwan & Muttaqin, 2020). The model is both comprehensive and adaptable, making it applicable to companies of varying sizes and across diverse industries (Lima-Junior & Carpinetti, 2019). Therefore, the Supply Chain Operations Reference (SCOR) Model is a process reference model that possesses the capability to assess and enhance supply chain performance.

The SCOR Model is widely recognized as a valuable instrument for organizations seeking to optimize their supply chain performance. Through the implementation of a well-defined framework, organizations are able to effectively measure, benchmark, optimize processes, and align their activities with business objectives. This approach facilitates the streamlining of operations, cost reduction, enhancement of customer service, and ultimately, the attainment of a more competitive position within the market. Consistent adherence to the guidelines established by the SCOR Model has the potential to result in enduring enhancements in supply chain performance along with company performance as a whole.

2.3 Conceptual Framework

A conceptual framework refers to a comprehensive arrangement of viewpoints, assumptions, prospects, convictions, and concepts that serves as a foundation and provides guidance for research endeavors (Robson & McCartan, 2016). The study conducted by Shields and Nandhini (2013) demonstrates the correlation between the variable that is dependent and the independent variable. The study focused on the

performance of firms in the electricity energy sub-sector as the dependent variable, while the independent variables included demand forecasting, strategic sourcing, supply chain risk management, and contract management. The utilization of compliance with procurement regulations compliance was employed as a moderating variable.

The study employed various methods and practices to examine different aspects of supply chain management. Consumption data, sharing information with trade partners, communication systems, and environmental scanning were utilized to implement demand forecasting practice. Sourcing decisions, selection criteria, supplier base, and negotiation approaches were employed to measure strategic sourcing practice. Risk management methods, sources of risk, risk mitigation strategies, and risk drivers and consequences were utilized to assess the level of supply chain risk management practice. Team structures, communication systems, managing performance, and contract administration were employed to operationalize contract management practice. The moderating effect of procurement regulations compliance was assessed using regulations and procedures, while revenue generation, order cycle time, and customer satisfaction were evaluated as outcomes.

The selected variables offer a thorough framework for comprehending the impact of efficient supply chain management on the development of Kenya's energy sector. The performance of enterprises in the electricity energy sub-sector is directly influenced by these independent variables: Enhanced prediction of future outcomes results in more effective distribution of resources, decreased expenses, and improve dependability. The strategic acquisition of goods and services contributes to financial savings, heightened productivity, and a strong foundation of suppliers. Efficient risk management reduces interruptions, guarantees fuel stability, and protects against monetary damages; and excellent contract management mitigates delays, promotes supplier cooperation, along with minimizing costs. The level of organizational performance was evaluated based on the information provided in Figure 2.1.

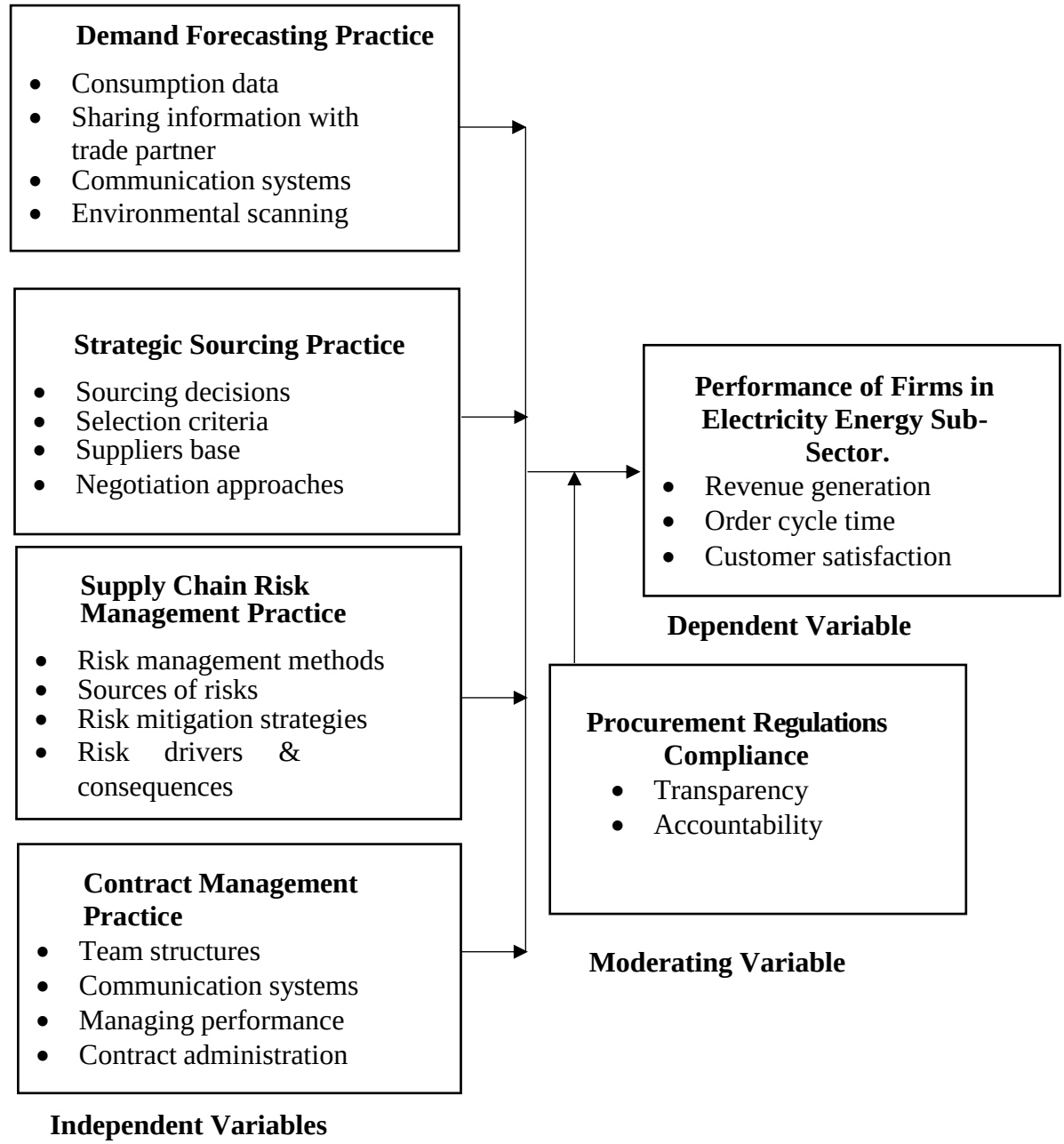

Figure 2.1: Conceptual Framework

2.3.1 Demand Forecasting Practice

According to Albarune and Habib (2015), forecasting serves as the initial step in supply chain management (SCM), setting in motion the subsequent activities within SCM. Within the realm of supply chain management (SCM), the act of forecasting is widely regarded as a pivotal element in the formulation of plans and the facilitation of

decision-making procedures (Habib, 2011). The significance of forecasting in business planning and management has been consistently acknowledged (Wang & Disney, 2016). Irrespective of the specific industry or the nature of the company, be it a manufacturer, wholesaler, retailer, or service provider, the implementation of efficient demand forecasting techniques enables organizations to effectively identify potential market prospects, strengthen their relationships with distribution channels, enhance customer satisfaction, minimize inventory investment, mitigate the risk of product obsolescence, optimize distribution operations, streamline production processes, and anticipate forthcoming financial and capital needs (Kilgar & Wagna, 2015).

To achieve optimal outcomes and resource utilization, it is imperative to engage in collaborative forecasting practices with various stakeholders, including suppliers, third-party logistics providers, financial institutions, and supply chain departments (Barlas & Gunduz, 2011). The act of sharing information has been found to enhance the accuracy of forecasts, thereby allowing companies to promptly address customer demand and ultimately leading to higher levels of customer satisfaction (Yan & Wang, 2012). The dissemination of information and the utilization of effective information systems have been found to decrease fluctuations in orders at earlier stages of the supply chain, thereby improving the overall performance of companies (Wang & Disney, 2016). According to Barlas and Gunduz (2011), a significant factor contributing to order variability is the lack of coordination in forecasting and information sharing. When all stages of a supply chain collaborate to generate a joint forecast, the resulting accuracy of the forecast enhances the responsiveness and efficiency of the supply chain in meeting customer demands.

The advancement of electronic communication systems has facilitated the ability of partners in Supply Chain Management to exchange real-time data and information throughout the supply chain network, resulting in dual advantages for inventory management and customer service (Flieder, 2014). According to Flieder (2014), the initial sharing of information among trading partners facilitates the development of long-term perspectives on demand within the supply chain. This, in turn, improves the capacity to coordinate planning and execution activities. Minjire and Waiganjo (2015) conducted a study which demonstrated that inadequate communication and a

deficiency in collaborative planning and decision-making processes are influential factors that impact performance. The potential benefits of demanding visibility from all actors in the supply chain are manifold and significant. These benefits encompass increased sales, improved service levels, reduced inventory levels, enhanced order response time, decreased system expenses, and higher fill rates, among other advantages (Adusei & Awunyo-Vitor, 2014). The absence of a collaborative planning process results in inefficiencies within the supply chain, including increased investments in inventory, challenges in effectively managing seasonal demand fluctuations, inadequate forecasting of demand, and the inability to address supply constraints related to capacity or availability of materials (Kumar, 2015).

The forecasting of demand serves as the foundational element for operations planning and plays a critical role in facilitating the achievement of a company's strategic objectives (Ehrenthal, Gruen & Hofstetter, 2014). According to Fliedner (2014), the initial source of the joint forecast should be the demand forecast at the retail level. This forecast is subsequently employed to coordinate the replenishment of orders, scheduling of production, formulation of purchase plans, and positioning of inventory in a sequential manner upstream throughout the entire supply chain. The proposed solution entails the establishment of an online platform where participants in the supply chain can exchange their demand expectations. This platform aims to enhance operational efficiency by facilitating faster communication, reducing implementation expenses, and improving accessibility for all stakeholders involved in the supply chain. The system should possess the qualities of simplicity, comprehensibility for all participants, flexibility, and the ability to accommodate diverse supply chain structures and forecast procedures (Ireland & Ron, 2000; Bruce, 2000).

In order to facilitate the attainment of collaborative forecasting within organizations, Flieder (2014) has put forth a comprehensive framework consisting of five distinct steps that must be adhered to by the entities. The process involves several key steps, which encompass the establishment of front-end partnerships agreements, joint business planning, the formulation of demand forecasts, and the sharing of forecast and inventory replenishment (Flieder, 2014). The increased integration of activities has the potential to result in a decrease in transportation costs, handling costs,

information costs, product costs, and forecast errors, while simultaneously enhancing managerial efficiencies. The occurrence of forecast error can be attributed to the choice of forecast technique employed by an organization. In order to enhance the precision of forecasting techniques, it is imperative to consider the impact of the operational context, as stated by Chindia, Wainaina, Kibera, and Pokhariyal (2014).

Haria (2016) also demonstrated that various macro environmental factors, including political conditions, competition, consumer purchasing power, and weather patterns, exert influence on the process of forecasting. According to Reiner and Fichtinger (2009), it is suggested that the evaluation of forecast techniques should not be limited to traditional performance indicators, but rather should consider the application of additional indicators. The electricity power supply and demand in Kenya exhibit frequent fluctuations, thereby exacerbating the adverse consequences of power shortages on the economy and exerting a detrimental influence on the operational efficacy of firms within the electricity energy sub-sector (Kamband & Mshana, 2021). In the year 2013, a significant majority of businesses in Kenya, specifically 70%, indicated that they had implemented a backup power generation system in order to address the issue of power interruptions. Consequently, this situation underscores the importance of engaging in collaborative forecasting efforts.

The load forecast plays a crucial role in determining the expansion program within the electricity power sector. The determination of future requirements for both capacities in megawatts (MW) and electricity energy sub-sector in gigawatt-hours (GWh) is crucial for the planning of a supply system that can effectively meet demand, as well as for making informed decisions regarding future generation and transmission investments (GoK, 2015). Accurate power demand forecasting is of utmost importance as it necessitates the efficient allocation of limited resources to meet the required supply. According to the Government of Kenya (GoK, 2016), an accurate prediction of high load would result in excessive investment in costly redundant capacities. Conversely, an inadequate estimation of demand would lead to capacity deficiencies, impeding economic progress and the implementation of social programs. The significance of collaborative forecasting in the electricity energy sub-sector can be extended from Kenya Power Company to the primary fuel suppliers.

If Kenya Power determines the scheduling of different connections based on the projected demand within a specific timeframe, it is necessary to integrate these connection decisions into an updated demand forecast. The transmission company relies on the updated forecast to strategically plan and make informed decisions regarding its transmission line capacity and construction. Similarly, both KenGen and IPPs rely on the forecast to effectively plan and make decisions regarding their generation capacities and primary fuel suppliers. Additionally, the forecast aids primary fuel suppliers in planning their capacities, inventories, as well as extraction and transportation processes. Organizations within the electricity energy sub-sector that do not possess an up-to-date forecast, which takes into account the anticipated connections to be established within a specific timeframe, are unlikely to possess an adequate supply to meet customer demands. Consequently, this deficiency in supply may negatively impact both supply chain profitability and service levels (Fliedner, 2014).

2.3.2 Strategic Sourcing Practice

In order to facilitate the production of goods and services, organizations require inputs. The inputs can encompass both tangible resources, including raw materials along with personnel, as well as intangible resources, such as knowledge and expertise. All inputs are derived from a specific source, thus necessitating the implementation of sourcing activities (Dobler & Burt, 1996; Leenders & Fearon, 1997). According to Baily, Farmer, Jessop, and Jones (2005), the selection of the appropriate supply source is a critical aspect of sourcing decisions. If the appropriate source selection is made, the purchasing organization's requirements would be effectively fulfilled. Under such conditions, the acquisition of necessary goods and services would be consistently ensured (Baily, Farmer, Jessop & Jones, 2005). Sourcing encompasses the process of actively exploring the market to identify potential input sources, ensuring the ongoing availability of these sources, exploring alternative sources, and maintaining up-to-date knowledge in this domain (Vollman, Berry, & Whybark, 2004).

According to Burke (2007), a firm's sourcing strategy encompasses three essential interconnected decisions: the establishment of criteria for building a supplier base, the

selection of suppliers eligible to receive orders from the firm, and the determination of the quantity of goods to be ordered from each selected supplier. The complexity of sourcing is directly proportional to the increase in the variety of raw materials, ingredients, components, elements, connectors, equipment, products, equipment, supplies, including services, as well as the expansion of the number of buyers involved in the decision-making process (Duffie & Koester, 2005). Duffie and Koester (2005) assert that within a global enterprise, a single purchasing decision can have far-reaching effects on different company procedures or departments, such as production, receiving, distribution, sales, marketing, as well as customer support.

Sourcing has undergone a transformation from a conventional purchasing method characterized by transactional and opportunistic behavior, in which organizations would procure goods and services based on immediate requirements and freely select from a pool of suppliers capable of meeting those needs. It has now evolved into a forward-thinking approach that employs long-term plans and strategies (Boateng, 2012). Numerous organizations have recognized the necessity of enhancing the conventional procurement function to a contemporary strategic sourcing approach in order to enhance value throughout the supply chain. This is due to the significant consequences and subsequent repercussions that can arise from the procurement of incorrect items, services, or engagement with unsuitable suppliers (Duffie & Koester, 2005). The potential outcomes can vary, encompassing delayed delivery, complete service failure liability, and potential impact on market competitiveness.

Strategic sourcing refers to a methodical and evidence-driven strategy aimed at optimizing an organization's supply base and enhancing the overall value proposition (Lewicki, Barry, Saunders, & Minton, 2002). The scope of this concept surpasses mere supplier price negotiation and instead centers on the comprehensive evaluation of Total Cost of Ownership (TCO), which takes into account customer requirements, organizational objectives, and market dynamics. The aim is to obtain the most advantageous product or service in terms of value, employing a meticulous and cooperative methodology (Amajor, Smith, & Moreland, 2015). The approach encompasses all factors influencing savings, employs evidence-based analysis and market insights, and is an ongoing endeavor.

The primary goals of strategic sourcing involve cost reduction while simultaneously preserving or enhancing the quality of a product or service. It entails a comprehensive evaluation of supplier relationships throughout the entire organization and the optimization of the organization's overall expenditure (Su, Dyer & Gargeya, 2009). The term "Strategic Sourcing" is employed to denote the situation in which sourcing activities are closely aligned with a well-defined sourcing strategy. The sourcing strategy encompasses more than simply choosing suppliers that meet certain criteria; it also involves cultivating relationships with these suppliers (Pulles, et al., 2014). Sourcing strategies are a component of the broader purchasing strategy and involve determining the appropriate number of suppliers for a specific component, product, or service. This decision is influenced by the significance of the component, the characteristics of the supply market, and the interrelationships among suppliers (Van Weele, 2001; Cousins, et al., 2008).

The sourcing decisions made by a firm have various economic implications for the buying organization, the suppliers involved, and other entities within the business network (Gadde, et al., 2010; Håkansson, et al., 2009). Baraldi et al., (2014) emphasize the significance of relational and inter-organizational aspects in the context of sourcing strategies. Various sourcing strategies have been developed (Bildsten, 2015). The various sourcing strategies identified by Dubois and Fredriksson (2008) encompass single sourcing, multiple sourcing, dual sourcing, delegated sourcing, parallel sourcing, network sourcing, and triadic sourcing. According to Lewicki, et al. (2002) sourcing and strategic sourcing are critical steps in buying goods and services. Organizations engage in the process of analyzing, evaluating, and choosing vendors and their offerings, taking into consideration predetermined specifications and requirements. The establishment of a relationship between parties is commonly recorded in a contractual agreement that outlines the specific terms and conditions pertaining to the provision of products, services, pricing, and service standards.

The impact of strategic sourcing on organizational performance was examined by Kihanya, Wafula, Onditi, and Munene (2015) in their research titled "The Role of Strategic Sourcing on Organization's Performance." The research conducted revealed that the implementation of strategic sourcing allows organizations to focus on their

primary activities, leading to the attainment of strategic advantages. Additionally, strategic sourcing serves as a mechanism for addressing business conditions or issues in a more efficient and effective manner (Kihanya et al., 2015). In a separate investigation conducted by Nyabuto (2016), the examination of the impact of strategic procurement on the operational outcomes of public enterprises in Kenya was undertaken. The analysis of a specific instance involving Kenya Power Limited has demonstrated that the implementation of strategic procurement practices yields favorable outcomes, including cost reduction and enhancements in the quality of products and services within an organization.

The electricity energy sub-sector's supply chain comprises five primary functional stages: the supply of the primary sources of fuel, generation, transmission, distribution, and supply to the end-user (Seth & Scott, 2013). It is imperative for power utility companies to effectively identify and secure appropriate sources of raw materials, as well as establish efficient distribution as well as storage services. The primary objective behind the decision of the Kenyan government to unbundle the power sector was to improve the overall efficiency of power generation, transmission, and distribution. Additionally, this move aimed to foster a competitive environment among the various stakeholders involved in the electricity energy sub-sector supply chain (Karekezi & Kimani, 2004). Consequently, the primary fuel stage has witnessed the emergence of multiple supply markets. The primary fuel sources utilized in the electricity energy sub-sector in Kenya encompass hydro, geothermal, thermal, cogeneration, coal, and wind, among other options, as indicated by the Ministry of Energy and Petroleum (2013).

While the introduction of competition at the generation stage has occurred, there remains a lack of options in the supply market. Nevertheless, organizations at various stages must acquire a range of requirements from external entities, including other organizations and stakeholders. These requirements encompass diverse elements such as land, plant and equipment, parts, transport, information, and skills. It is imperative for organizations to strategically source these elements in order to capitalize on opportunities for cost reduction, enhance their ability to provide efficient services, and enhance their product and service offerings through upgrades and improvements.

Nyambuto (2016) identifies several challenges encountered by organizations during the implementation of strategic sourcing. These challenges encompass technological changes, employees' deficiency in negotiation skills, inadequate management commitment, and insufficient governing legislation and rules.

2.3.3 Supply Chain Risk Management Practice

According to the Association of Project Management (2016), risk is defined by the Project Management Institute as an ambiguous event or circumstance that, if it materializes, can have either a favorable or unfavorable impact on the objectives of a project. According to the Association for Project Management (APM), risk is defined as an uncertain event or circumstance that, if it were to occur, would impact the attainment of a project's objectives (APM, 2016). The susceptibility of supply chains to unforeseen events has increased, potentially resulting in supply disruptions and compromising the overall performance of the supply chain (Kihyun, 2012). According to Zsidisin et al. (2010), supply chain risk refers to the possibility of experiencing an inbound supply incident that results in the failure to fulfill customer demand. Giunipero and Eltantawy (2004) define supply chain risks as encompassing various risks associated with the flow of information, materials, and products, starting from the initial supplier and extending to the final product delivery for the end user.

Supply chain risks encompass the potential occurrence and consequences of a discrepancy between the supply and demand within a given system. According to Christopher and Lee (2001), risk sources encompass various factors, such as environmental, organizational, and supply chain-related variables. These factors are characterized by their unpredictable nature and have the potential to influence the outcome of the supply chain. According to Ouabouch and Pache (2014), the authors propose that supply chains are affected by three distinct sources of uncertainty. These sources include supplier uncertainty, which stems from factors such as on-time performance, average lateness, and degree of inconsistency. Additionally, manufacturing uncertainty arises from issues related to process performance, machine breakdowns, and supply chain performance. Lastly, customer or demand uncertainty arises from forecasting errors and irregular orders. The need for supply chain risk

management arises from the focused supply chain outcomes, such as costs or quality, that are associated with risk consequences (Hendrics & Singhal, 2005).

The management of risk is an ongoing and iterative process that requires sustained commitment from all participants within the supply chain (Zsidisin et al., 2010). The management of supply chain risk is commonly understood to involve either proactive measures to mitigate risks or reactive measures to respond to risks (Tomlin, 2006; Ghagde, Dani & Kalawsky, 2013). The concept of supply chain risk management encompasses the principles of both supply chain resilience and supply chain vulnerability, as discussed by Sorensen in 2005. Ponomarov and Holcomb (2009) assert that supply chain resilience constitutes a significant component of supply chain risk management (SCRM). Supply chain resilience refers to the capacity of organizations to proactively anticipate, accurately identify, promptly respond to, and effectively learn from various incidents (Craighead, Blackhurst, Rungtusanatham, & Handfield, 2007; Sheffi, 2006). According to Christopher (2005), resilient processes possess the characteristic of agility, enabling them to adapt rapidly. According to Murigi (2013), the inherent adaptability of capability enables the supply chain to effectively restore its functionality following a disruption, thereby reverting back to its initial state or attaining a more favorable state of supply chain operations.

The concept of a resilient supply chain encompasses various components, such as formulating a strategy for the supply base, engaging in collaborative planning, ensuring visibility, and incorporating considerations for fostering a resilient culture within the supply chain decision-making process (Arani, 2015). According to the definition provided by Wagnar and Neshat (2012), supply chain vulnerability refers to the state of being exposed or susceptible to significant disruptions that may arise from both internal and external risks within the chain. When a supply chain is susceptible to a disruption, it becomes imperative to cultivate resilience within the supply chain. This is necessary in order to enable the network to regain a desired service level promptly following a disruption (Ambulkar et al., 2015; Pettit et al., 2013). The occurrence of supply chain risks can result in substantial negative consequences for the supply chain, leading to a ripple effect that impacts final consumers. This is due to

the interdependence of each component within the supply chain, as every link relies on the others to fulfill product or service demands (Mizgier et al., 2013).

As stated by Waters (2007), vulnerability pertains to the inherent susceptibility of a supply chain to experiencing disruptions, which arises as a result of the risks present within it. The primary objective of supply chain risk management is to identify and assess potential sources of risk within the supply chain, and subsequently implement suitable measures to mitigate or control these risks (Svensson, 2002). Supply chain risk management encompasses the process of identifying and effectively managing risks within the supply chain. This involves a collaborative approach among various members of the supply chain, with the ultimate goal of mitigating vulnerabilities across the entire supply chain (Kern, Moser, Hartmann & Moder, 2012). To effectively manage risk, organizations are increasingly adopting strategies to establish closer relationships with key stakeholders in the supply chain (Chen, et al., 2013). Organizations are employing various strategies to enhance their influence and mitigate the challenges posed by uncertainty. These strategies encompass mergers and alliances (Kilubi & Haasis, 2015), the adoption of e-procurement to facilitate the integration of supply chains and consequent reduction in transaction costs (Wagner & Neshat, 2012), as well as collaborative supply management practices that enhance product reliability and mitigate risks associated with product introduction (Chen, Sahol & Prajogo, 2013).

Hewlett Packard (2006) posits that supply chain risk management can be achieved through the implementation of contingency planning strategies and the development of supply chains that possess greater resilience and agility (Ngugi, 2013). Ponomarov (2012) and Yang and Yang (2012) have proposed that the implementation of a cross-company supply chain orientation is advisable for effectively managing risks within the supply chain. The implementation of supply chain risk management aims to mitigate disruptions within the supply chain, resulting in reduced time delays, cost savings, enhanced customer satisfaction through punctual delivery, heightened productivity, and improved information dissemination (Victoria, Nyamwange & Harley, 2017). It is imperative for firms operating within the electricity energy sub-sector to effectively mitigate risks associated with power connection delays, elevated

costs, and power supply disruptions resulting from equipment breakdown and vandalism.

2.3.4 Contract Management Practice

Within the realm of business, it is customary for an entity to engage contractors or suppliers in order to fulfill its desired service or product needs (Kumar & Markeset, 2007). Consequently, the organization is compelled to engage in contractual agreements with suppliers or contractors, thereby necessitating the implementation of contract management practices. Contract management refers to the systematic administration and oversight of contractual agreements established with various entities such as vendors, partners, customers, or employees. The practice of contract management encompasses the process of engaging in negotiations to establish the terms and conditions of contracts, as well as the subsequent task of ensuring adherence to these terms and conditions. Additionally, it involves the documentation and mutual agreement upon any modifications that may arise during the implementation or execution of the contract (Shiwa, 2014).

According to Hotterbeekx (2013), contract management can be defined as the systematic procedure aimed at ensuring that all parties involved in a contract fulfill their respective obligations, with the ultimate goal of satisfying both the operational objectives of the contract and the strategic business goals of the customer. Contract lifecycle management (CLM) encompasses the systematic and efficient management of contract creation, execution, and analysis in order to optimize financial and operational performance while mitigating risk (Bhardwaj, 2011). According to Cruz and Marques (2012), contract management encompasses the systematic procedures employed by both contracting parties to effectively fulfill their respective obligations and achieve the desired objectives outlined in the contractual agreement.

Rendon's (2010) study, as cited by Oluka and Basheka (2012), examined the crucial factors that contribute to the success of contract management. These factors include the presence of a skilled and competent workforce, well-defined processes, positive relationships, sufficient resources, effective leadership, collaborative teamwork, and clearly outlined policies. It is important to note that these factors directly influence the

performance of contractors. In their study, Mutua, Waiganjo, and Oteyo (2014) highlighted several crucial contractual devices, including well-defined objectives in contracts, acceptance criteria, training in contract management, and mechanisms for resolving disputes. According to Costa et al. (2009), the management of contracts for Engineering Procurement Construction (EPC) projects encompasses six key areas: finance management, health, safety and environment (HSE) management, quality management, schedule management, human resources (HR) management, and procurement management.

The key components of contract management, as outlined by CIPS (2012), encompass contract communication, contract administration, performance management, relationship management, and contract renewal or termination. According to Prosidian Consulting (2011), the implementation of effective contract management functions within an organization can enhance profitability, ensure compliance, and mitigate risks. Conversely, Nguyen (2013) argues that inadequate management of contracts can result in compromised operational control, diminished customer satisfaction, heightened risks, and unnecessary expenses. Additionally, Marcos (2013) highlights the issue of cost overruns in relation to contract management. Based on a study conducted by Prosidian Consulting (2011), surveys administered to supply and demand chain executives regarding the intricacies and hazards associated with project contracts have indicated a substantial financial loss resulting from inadequate project contract management.

The implementation and oversight of contracts in a proficient manner contribute to the enhancement of the caliber of goods and services, as well as the reduction of procurement expenses. Consequently, this facilitates the attainment of three overarching objectives: the provision of high-quality products and services, the timely delivery of said products and services, and the achievement of cost efficiency (Basingstoke & Deane, 2013). According to Chepngetich, Waiganjo, and Karani (2016), the implementation of effective contract management practices has been found to facilitate the successful completion of projects within the predetermined budget and timeframe. The contract management stage encompasses the entire duration of the agreement, commencing from the date of contract effectiveness and concluding at the

termination of the contract period (PPIAF, 2012). According to the Office of Government Commerce (OGC, 2012), contract management is a continuous process that spans the entire duration of a procurement process or project. It entails proactive management to anticipate future requirements and respond to unforeseen circumstances, including the potential need for renegotiation. One of the key aspects of ongoing contract management involves ensuring that the payments made by the buying organization to the vendor for services rendered are aligned with specific service delivery standards over time. This alignment is subject to performance-based abatement, as highlighted by Bhardwaj (2011). The objectives of contract management in supply chain management (SCM) encompass the following: Ensuring the consistent and exemplary delivery of services in accordance with the terms of the contract, while appropriately administering payments or penalties; Upholding the practical implementation of contractual obligations and the allocation of risks, while efficiently managing the responsibilities and risks of the involved parties. The effective identification and response to both risks and opportunities in the external environment are ensured. The agreed distribution of risk is upheld and the achievement of Best Value is prioritized. Regular monitoring of the service provider's performance against the specified outputs is conducted to ensure that any financial consequences resulting from inadequate performance are duly considered and addressed. Payment for the service is contingent upon the quality of the service provider's performance. Services are delivered in accordance with the terms of the contract, and efforts are made to continuously enhance contract performance and service delivery. (EPEC, 2014).

One additional primary objective of contract management is to acquire the services specified in the contract, with the ultimate goal of optimizing the value obtained in relation to the cost incurred (Contract Management Guide, 2003). This entails the enhancement of efficiency, effectiveness, and economy in the provision of services or the maintenance of relationships outlined in the contract. It involves carefully weighing costs against risks and actively overseeing the management of these relationships (HM Treasury, 2009). Effective contract management is crucial in preventing additional expenses and delays for clients, as well as addressing potential challenges for contractors or suppliers. This practice ensures that both parties fulfill or surpass their respective responsibilities, while also ensuring that the organization

obtains optimal value for its resources (EPEC, 2014). The findings of a study conducted by Chepng'etich, Waiganjo, and Karani (2016) revealed that the implementation of efficient contract management practices within Kenya Power Company has resulted in the successful completion of projects within predetermined budgetary and temporal constraints. Furthermore, this implementation has facilitated the attainment of a competitive advantage for the organization and has contributed to a reduction in supply chain costs.

Elsey (2007) outlines the key elements of contract management, which encompass the establishment of a contract management team. This involves making decisions regarding the timing of team formation, the team's structure, the qualifications of its members, and identifying any initial or continuous training requirements. The process of managing relationships, which involves establishment and maintenance of sustainable partnerships of trust and respect among the parties involved in the procurement or supply process. This involves the establishment of relationships, communication routes, and systems, as well as actively supporting and enhancing them throughout the entire duration of the process. Service performance management comprises evaluating whether the services provided by the service provider meet the prescribed standards, determining the effectiveness of corrective actions, and identifying any discernible patterns in service provision. Contract administration is a crucial process that aims to ensure the fulfillment of obligations and responsibilities as outlined in a contract. Its primary objective is to effectively manage under-performance, risks, payment of the unitary charge, reporting, and change. By doing so, contract administration strives to achieve value for money and facilitate continuous improvement.

Within the electricity energy sub-sector, it has been observed that organizations exhibiting deficient contract management practices tend to foster an environment conducive to corruption and a lack of transparency. This situation poses a significant challenge to the aspirations of firms operating within the electricity energy sub-sector. The repercussions of such a scenario include the imposition of higher tariffs and the implementation of more stringent measures for revenue collection, which ultimately outweigh any potential advantages derived from enhanced service performance

(Burke, 2012). The inadequate management of the supply chain within this sector is evident through various manifestations, including power outages, delays in power connections, power loss, and escalated tariffs, among other issues.

2.3.5 Procurement Regulations Compliance

A regulation can be understood as a tool utilized to execute a strategic plan. It is characterized as a set of rules, whether explicitly stated or implied, that are established to steer an organization towards its desired goals and provide guidance to decision-makers within the organization (Lyson & Gillingham, 2003). Procurement regulations compliance is the extent of adherence to the set rules and standards that govern the acquisition of goods, services and works in an organisation. (Findlay, 2018).

Erik and Vennstrom (2008) asserts that, the purpose of adhering to procurement regulations is to enhance operational supply chain performance by efficiently delivering products, services or works to the end customer within the specified time frame and at the lowest possible cost. Procurement regulations encompass a collection of rules, regulations, and procedures that are established to govern the procurement process of goods and services required for the effective functioning of an organization (Wisegeek, 2013). The established regulations and procedures are designed to promote fair competition among businesses (Charles, 2007). In addition, organizations aim to reduce costs related to the procurement of goods and services through the implementation of various strategies. These strategies include engaging in volume purchasing, selecting pre-qualified vendors, and setting re-order levels that effectively maintain low inventory levels while ensuring the smooth functioning of the operation (Magutu, et al., 2016).

According to Zuzana (2012), the presence of effective purchasing regulations plays a crucial role in facilitating good public financial management and ensuring the successful implementation of budgets. Similarly, Mutai and Chirchir (2015) argue that the establishment of purchasing and supply regulations and procedures within organizations is instrumental in promoting transparency, efficiency, and accountability in their operational activities. The effective compliance with procurement regulations has been found to yield several significant advantages. These benefits encompass the

attainment of value for money, the safeguarding and improvement of the environment, the optimization of resource utilization, the promotion of social inclusion, the establishment of fair and ethical trade practices, the enhancement of risk management capabilities, the reduction of costs, the cultivation of improved relationships with suppliers, and the attainment of a competitive advantage (Talluri, 2008). The study conducted by Njeru, Ngugi, Arasa, and Kahiri (2014) reveals that a meticulously crafted and executed purchasing and supply regulations establishes a structure for the effective implementation of supply chain management practices. According to Duncan (2009), regulations are obligatory and require strict compliance from all individuals, public entities, and activities within the organization.

The significance of sourcing regulations on performance in the public sector was demonstrated by Kisang and Kihara (2017). According to Lisa's (2010) research, a clear distinction exists between the public and private sectors, resulting in the establishment of distinct organizational environments despite having similar objectives. There exist distinct methodologies employed by the public and private sectors in the domains of procurement and supply chain management. The concept of public ownership entails certain responsibilities in terms of public accountability, necessitating the implementation of specified procedures and regulations. This ensures that all stages of the procurement process are adhered to, with each step being authorized by the appropriate governing body. According to Maiyo (2009), the implementation of purchasing regulations that align with existing laws often results in a significant number of bureaucratic processes, regardless of the value of the order. Additionally, these regulations are characterized by ineffective communication and a primary emphasis on unit price rather than fostering long-term relationships.

Kenya has implemented various policies, institutions, and legal frameworks over time to regulate the energy sector (IEA, 2015). According to the International Energy Agency (IEA, 2015), the electricity sub-sector in Kenya has undergone unbundling, accompanied by robust policy and regulatory reforms. These measures have effectively established a conducive environment for the involvement of independent power producers (IPPs). In Kenya, it is customary for all public organizations to establish and execute procurement regulations that adhere to the Public Procurement

and Disposal of Assets Act 2015 (PPDA, 2015), the Public Procurement and Disposal of Assets Regulations 2020 (PPDAR, 2020), and the Supplies Practitioners Management Act 2007, among other relevant legislations (GoK, 2016). Public entities are required to adhere to established policies, regulations and public procurement directives that outline the responsibilities and procedures that public sector organizations must adhere to in regards to procurement practices (Njeru, 2015). Private entities operating in the electricity energy sub-sector, such as Independent Power Producers (IPPs), may exhibit varying levels of compliance with procurement directives compared to public entities.

Power production in Kenya is carried out by the Kenya Generating Company Limited (KenGen), a publicly owned entity, as well as Independent Power Producers (IPPs), which are privately owned companies (MoE, 2011). Private companies are not obligated to adhere to government-established procurement procedures and regulations when conducting their supply chain and procurement operations. While regulations can effectively guide the smooth progression of activities within the supply chain, it is important to acknowledge that unintended consequences may arise, particularly when organizations adopt different regulations in pursuit of similar objectives. These unintended impacts have the potential to create a more contentious environment for stakeholders involved in the supply chain, ultimately influencing overall performance (Paul, 2011).

2.3.6 Performance of Firms in Electricity Energy Sub-Sector

According to Lysons and Gillingham (2003), performance can be described as the evaluation, either in terms of quantity or quality, of the extent to which a company or its employees accomplish the overall or specific goals assigned to them. According to the definition provided by Ambe and Badehurst-Weiss (2012), supply chain performance can be characterized as a systematic evaluation process that involves conducting a comprehensive analysis to determine whether the appropriate procedures and regulations have been adhered to and if the desired goals have been successfully attained. Performance is considered a crucial aspect in the realm of businesses, as emphasized by Mutindi, Namusonge, and Obwogi (2013). The primary goal of

businesses revolves around the generation of profits. According to Iravo, Ongori, and Munene (2013), a significant inquiry in the field of business revolves around the factors contributing to the success or failure of organizations. According to Awino (2011), in order for an organization to achieve success, it is imperative to achieve substantial financial gains and effectively delineate the responsibilities and performance factors associated with various individuals within the organization. Njihia et al. (2013) emphasize the significance of performance measurement as a tool employed by firms to monitor activities, identify areas requiring attention, enhance motivation, improve communication, and strengthen accountability.

Performance measures in supply chain encompass a wide array of metrics, including both cost and non-cost measures (Lunga & Mbanje, 2015). These measures can be examined from various perspectives, such as financial and business process perspectives (Chopra & Meindl, 2010), as well as customer satisfaction, revenues, learning, and growth (Taghipour, Bagheri, Khodarezaei & Farid, 2015). Additionally, operational measures like quality performance and cycle time are also considered (Sherman, 2001). Performance measures are utilized in various capacities within the organization, such as serving as a foundation for evaluating and rewarding individuals, allocating limited resources among strategic business units, and making decisions aimed at enhancing future profitability (Chan & Qi, 2006). Hence, it is imperative for organizations to take into account the characteristics of supply chain management (SCM) practices that impact the performance of the supply chain. The significance of a well-structured performance measurement system lies in its ability to comprehend and enhance the performance of all participants involved in supply chain operations (Chan & Qi, 2006).

Historically, the approach to enhancing performance has revolved around the implementation of internally-oriented initiatives aimed at optimizing operational efficiencies within specific departments or functions. According to Sherman (2001), although these programs have the potential to generate continuous incremental improvements, the attainment of substantial changes and a notable competitive advantage necessitates a comprehensive understanding of the dynamics associated with process changes within the organization. This understanding should be

accompanied by the integration of activities, optimization of metrics that support the processes, and strategic alignment of participatory roles and organizations within the market structure in which they operate.

In order to address the diverse needs of various actors involved, it is necessary to devise technical and financial solutions that are based on market principles. These solutions should carefully balance factors such as output quality standards, processing speeds, costs, staff and facility capacities, input and capital quantities and costs, as well as the risk-bearing capacity of participants within the supply chain (Yang, Wang, Chen & Yuan, 2010). The aforementioned requirements exhibit interdependence, necessitating the integration and harmonization of targeted standards within a comprehensive performance management framework encompassing the entirety of the supply chain. Performance indicators of firms in the electricity energy sub-sector include revenue generation, which is influenced by the efficiency of the sub-sector chain in power provision. Another indicator is the total order cycle time, which is shorter when the processes are efficient. Additionally, customer satisfaction is a significant indicator, which can be achieved through a reduction in power outages. All of these phenomena may arise due to the presence of supply chain management practices (SCMPs).

2.4 Empirical Review

2.4.1 Demand Forecasting Practice and Performance

The correlation between demand forecasting practices and organizational performance has been extensively examined by numerous researchers. In their exploratory study titled "Forecasting Practices in Supply Chain Management," Albarune and Habib (2015) primarily examined the utilization of secondary data for forecasting demand management. The study was guided by four objectives, namely, comprehending the practice, management, and application of forecasting. The study focused on examining the limitations and proposing solutions for demand forecasting in the context of Supply Chain Management within the lifesaving industry, retail chain, and fast-moving consumer goods (FMCG) sectors. The study also introduced a forecasting management model to address the challenges. Several metrics employed in the

research encompassed the satisfaction of customer demands, mitigation of risks, and the minimization of the bullwhip effect. The results indicated that the utilization of forecasting in the three sectors was constrained, despite the presence of significant potential to incorporate forecasting as a managerial technique within the supply chain management (SCM) strategy.

In the study titled "Collaborative Supply Chain Forecasting: A Lean Framework," Fliedner (2014) introduced a conceptual framework aimed at forecasting supply chain demand through collaborative means. The framework also sought to facilitate coordination and integration of management activities among different partners in the supply chain, such as purchasing, production planning, and inventory replenishment. The paper provided an explanation of the concept and framework of collaborative forecasting, highlighting the potential benefits that can be attained through the adoption of collaborative supply chain forecasting. Additionally, the paper identified potential obstacles that could hinder the successful implementation of the approach. The potential benefits that were put forth encompassed increased sales, improved service levels, decreased inventories, accelerated cycle times, expedited order response times, elevated order fill rates, enhanced forecast accuracy, and diminished capacity requirements. The researcher also identified several key barriers to supply chain forecasting. These included a lack of trust and loss of control when sharing sensitive information, a lack of interest in internal and external forecast collaboration, challenges related to the availability and cost of technology and expertise, fragmented information sharing standards, concerns about data aggregation, and fear of collusion. Additionally, inexperience and a lack of skills were also identified as significant barriers.

In their study titled "Demand forecasting and sharing strategies to mitigate fluctuations and the bullwhip effect in supply chains," Barlas and Gunduz (2011) examined various structural factors contributing to the bullwhip effect and assessed the efficacy of information sharing in mitigating undesirable fluctuations. The study focused on analyzing a supply chain system with three stages, where each stage is composed of agents that were identical to one another. The study incorporated various parameters, namely standard ordering policies, external demand, and lead time. The findings

indicated that the bullwhip effect can be primarily attributed to a significant structural factor, namely the lack of synchronization and coordination in demand forecasting across different levels of the supply chain. The study suggested that the implementation of demand and forecast strategies should be shared among stakeholders to facilitate the creation of a collaborative forecast. This collaborative approach has been found to enhance forecast accuracy, thereby enabling supply chains to improve their responsiveness and efficiency in meeting customer demands.

In their study titled "Demand forecasting for supply processes in consideration of pricing and market information," Reiner and Fichtinger (2009) conducted analytical research in Austrian retail shops. The researchers devised a dynamic model for assessing enhancements in supply chain processes, taking into account various demand forecasting techniques with special considerations. The researchers employed the bullwhip effect in their study. The evaluation of various demand forecasting methods was conducted through the analysis of service level (fill rate) and the average on hold inventory measures. The results indicated that the practice of forecasting has a significant influence on the satisfaction of customer demands, the mitigation of risks, and the evaluation of enhancements in the Supply Chain process. The study also indicated that the assessment of forecast techniques should not be limited to traditional performance indicators such as mean absolute deviations (MAD), mean square error (MSE), and mean absolute percentage error (MAPE), among others. Additional measures may also be considered. Chindia, Wainaina, Kibera, and Pokhariyal (2014) conducted a study on the forecasting techniques, operating environment, and accuracy of performance forecasting (APF) for large manufacturing firms in Kenya. The researchers aimed to examine the relationships and interactions among forecasting techniques, operating environment, and APF. The assessment of the APF encompassed several key indicators, namely expected value, return on sales, return on assets, and growth in market share. The study demonstrated that in order to attain accurate and reliable Advanced Planning and Forecasting (APF), it is imperative for a forecasting technique to take into consideration the impacts of the operating environment. In a study conducted by Haria (2016), an examination was undertaken to assess the influence of market and macro factors on forecasting within fast moving consumer goods companies. The case study focused specifically on GlaxoSmithKline. The

findings of the study indicated that macro factors, including political factors, competition, consumer purchasing power, and seasonal variations, exert a significant impact on the forecasting process.

In their study titled "Conducting a Sales Forecasting Audit," Moon, Mentzer, and Smith (2003) presented a methodology aimed at conducting a comprehensive assessment of a company's sales forecasting practices. The primary objective of this audit was to facilitate a thorough evaluation of the company's existing sales forecasting processes and to identify potential areas for enhancement and refinement. The methodology underwent a five-year development process, which encompassed the participation of numerous auditors across sixteen organizations. The researchers posited a framework consisting of four dimensions for the purpose of examining the forecasting process. These dimensions encompass functional integration, approach, systems, and performance measurements. The study employed a range of organizations that varied in terms of the products and services they provided. However, these organizations shared a common understanding that implementing forecasting techniques would enhance their overall performance. The results of the study indicate that striving for ongoing enhancement in sales forecasting is a valuable objective for all organizations. Furthermore, companies that exhibited a favorable response to the audit process observed notable enhancements in their forecasting performance. The results of the study also indicated that forecasting is a separate and essential function within the realm of management. Groznika and Trkman (2012) conducted a study on contemporary issues and challenges of supply chain management in South Africa, and their findings align with the aforementioned research. They discovered that the sharing of information within the supply chain can serve as a potential solution to mitigate the occurrence of order variations across different echelons.

2.4.2 Strategic Sourcing Practice and Performance

According to Baily, Farmer, Jessop, and Jones (2005), the selection of the appropriate supply source is a critical aspect of sourcing decisions. If the appropriate sourcing decision is made, the purchasing company's requirements would be effectively fulfilled. Numerous organizations have recognized the necessity of transforming the

conventional procurement function into a contemporary strategic sourcing approach in order to enhance value throughout the supply chain. This shift is motivated by the recognition that the procurement process carries inherent risks, such as the acquisition of inappropriate items or services, or engaging with unsuitable suppliers, which can significantly and extensively affect business operations. In their study titled "Strategic Sourcing: Building a Foundation for Success - Understanding the Difference Between Sourcing and Strategic Sourcing and Its Impact," Duffie and Koester (2005) discovered that incorrect sourcing can lead to a variety of negative outcomes, including delayed delivery, complete service failure, and a potential decline in market competitiveness.

A study by Bildsten (2015) examined the variations in purchasing strategies across diverse organizations or countries. The objective was to conduct a comparative analysis and gain insights into the underlying factors influencing the adoption of diverse strategies by organizations. Interviews and observations were conducted in two factories located in different countries. The findings of the study indicated that variations in purchasing strategies are influenced by the specific requirements, anticipated outcomes, and organizational cultures of the companies involved. Nevertheless, certain procurement strategies exhibited similarities. In their 2009 study titled "Strategic sourcing and supplier selection in the U.S. textile, apparel retail supply network," Su, Dyer, and Gargeya (2014) examined the fundamental causal connections within supply chain management. The study explored the influence of strategic sourcing and supplier selection on the performance of firms. The study employed an empirical research methodology that relied on surveys, resulting in a response rate of 38.2%. The results of the study indicated that the implementation of strategic sourcing practices has a notable and favorable impact on the overall performance of businesses. Additionally, the process of selecting suppliers was found to have a significant and positive influence on a firm's ability to attain a competitive advantage.

In a study conducted by Burke (2005), the focus was on examining the sourcing strategy within a supply chain, with particular emphasis on the upstream relationship between a firm and its suppliers. The study investigated the differences between single and multiple supplier sourcing strategies. The research examined the optimal

conditions for a purchasing firm to adopt a single sourcing strategy as opposed to a diversified purchasing approach across different operational scenarios commonly encountered in practice. The study also investigated the impact of uncertainties in upstream and downstream activities on a firm's sourcing strategy. The findings indicate that adopting an order-splitting approach, such as implementing a multiple supplier strategy, is a favorable decision for the company, even in cases where suppliers exhibit significant variations in terms of their reliability and costs. The findings of the analysis indicate that it is necessary to evaluate the trade-off between the incremental advantages of diversification and the incremental costs associated with reallocating order quantities from suppliers with lower costs. From a managerial perspective, the study emphasizes the significance of aligning a firm's sourcing strategy with its corporate strategy in order to maintain consistency.

The impact of strategic sourcing on an organization's performance was examined by Kihanya, Wafula, Onditi, and Munene (2015) in their research titled "The Role of Strategic Sourcing on Organization's Performance." The study employed a descriptive research design. The research revealed that strategic sourcing plays a crucial role in enabling organizations to attain strategic advantage and serves as a mechanism for resolving business problems in a more efficient and effective manner. The researchers identified several key sourcing factors that significantly impact organizational performance, namely the quality and cost of goods and services, timely delivery of supplies, an effective procurement plan, and supplier relationship, in that particular sequence.

Chepng'etich, Waiganjo, and Karani (2016) conducted a descriptive case study to examine the impact of strategic sourcing on the organizational performance of a state corporation in Kenya, specifically focusing on the case of Kenya Power. The study conducted by the researchers has identified several factors that have an impact on the organizational performance of Kenya Power. These factors include supplier development, contract management, supplier relationship management, and early supplier involvement. In order to enhance their organizational performance, the researchers recommend that Kenya Power should consider partnering with suppliers who provide strategic items, involving these suppliers at an early stage, establishing

clear key performance indicators to actively monitor supplier performance, and implementing a supplier development program that aligns with the objectives of the organization.

2.4.3 Supply Chain Risk Management Practice and Performance

Numerous scholars, both domestically and internationally, have conducted research on the subject of Supply Chain Risk Management (SCRM). In their study titled "Risk Management in Supply Chain: Characterization and Empirical Analysis," Ouabouch and Pache (2014) conducted research on this subject matter. A survey was conducted on a sample of 158 Moroccan manufacturers by the researchers. This study examined six risks associated with the management of the upstream supply chain. These risks encompassed issues such as logistical performance failures by suppliers, incorrect interpretation of needs by suppliers, suppliers' inability to fulfill large orders, product shortages and bottlenecks within the supply market, and unplanned shutdowns of key suppliers' production. Three operational risks were identified, namely, disruptions of own production units resulting from internal incidents, shutdowns caused by technical problems, and disruptions of computer infrastructures. The analysis also considered four risks associated with the management of the downstream supply chain. These risks encompassed the provision of inaccurate information regarding orders, significant fluctuations in final demand, order cancellations by clients, and delayed or non-existent payments from clients. The study's findings have substantiated the notion that risks pertaining to the supply chain have a detrimental impact on the logistical performance of organizations.

In their study, Chen et al. (2013) examined the utilization of supply chain collaborations as a means of mitigating risks within the context of 203 manufacturing companies in Australia. The results indicated that the establishment of supply chain collaborations can lead to a substantial reduction in supply chain risks. In their 2012 study titled "Supply Risk Management: Model Development and Empirical Analysis," Kern et al. surveyed 162 manufacturing companies of varying sizes in Germany. The study aimed to validate the ongoing influence of three key risk management processes: risk identification, assessment, and mitigation. The results indicated that the

implementation of effective Supply Chain Risk Management (SCRM) practices within companies is associated with enhanced organizational performance. According to Hendricks and Singhal (2005), the study demonstrated that supply chain disruptions have a significant negative impact on the financial performance of affected organizations. The researchers additionally discovered that these firms exhibit a gradual recovery process in response to the negative impacts resulting from such disruptions. The study conducted by Papadakis (2006) investigated the impact of supply chain disruptions on the financial performance of organizations. The researcher's findings indicated a decline in the stock price of the firm as a result of supply chain risks. The researcher additionally asserted that the exposure to risk poses challenges for companies in their ability to forecast and prepare for supply chain disruptions, including those resulting from both human-induced and natural disasters.

In their 2003 study titled "Supply Chain Risk Management: Outlining an Agenda for Future Research," Peck and Christopher proposed a categorization of supply chain risk sources into three distinct categories: environmental risk sources, network-related risk sources, and organizational risk sources. The researchers have identified four fundamental constructs in their definition of supply chain risk management, namely supply chain risk sources, risk consequences, risk drivers, and risk mitigating strategies. The researchers employed a positive research perspective in order to elucidate, explicate, forecast, and comprehend the supply chain risk management activities that are presently being practiced and those that truly exist. The employed methodologies encompassed qualitative approaches, including in-depth interviews and case studies, as well as quantitative surveys. The research findings presented empirical evidence supporting the notion that an organization's risk concept significantly influences the extent to which supply chain risk management is implemented and the specific strategies employed by practitioners to mitigate risks.

In their study titled "Securing the Upstream Supply Chain: A Risk Management Approach," Giunipero and Eltantawy (2004) examined four factors: the level of product technology, the necessity for security, the significance of the supplier, and the purchasers' previous experience with the situation. These factors were utilized to assess the extent of risk management within the supply chain. The research revealed

that in order to address supply risks and cultivate a competitive edge, it is imperative for supply professionals to effectively manage the relationships within the supply chain and enhance the exchange of information and communication endeavors. The results underscored the significance of interpersonal communication, capacity to collaborate in teams, and proficiency in negotiation.

Several studies have been conducted in Kenya regarding the management of supply chain risks. In a study conducted by Murigi (2013), the focus was on investigating the strategies employed by Brookside Dairy Limited in Kenya to mitigate the impact of supply chain disruptions resulting from natural disasters. The research utilized a descriptive survey methodology and found that various strategies, including prompt responses to disruptions, maintaining buffer inventory, fostering collaborative relationships, developing comprehensive supply chain continuity plans, and obtaining insurance, can effectively mitigate the impacts of supply chain disruptions. Mburu, Ngugi, and Ogolla (2015) conducted a study that aimed to assess the impact of risk identification management strategies on the performance of supply chains in manufacturing companies located in Kenya. The researchers employed a cross-sectional survey methodology to investigate a sample of 153 manufacturing companies. The study employed a census approach. The research findings indicate that it is crucial for organizations to recognize their strengths and core competencies within the market. Additionally, they should effectively address and mitigate risks throughout the supply chain by implementing risk management strategies. This approach is necessary to minimize the susceptibility of their supply chain, considering the unpredictable nature of contemporary global competitive markets.

A study conducted by Arani, Mukuru, Waiganjo, and Musyoka (2015) investigated the utilization of enhancers to enhance supply chain resilience within the manufacturing sector of Kenya. The research employed a cross-sectional survey design to investigate a sample of 62 manufacturing firms. Both qualitative and quantitative methods were utilized in the study. The results of the study indicated that there is a statistically significant positive linear association between risk awareness and the performance of manufacturing firms in Kenya. The objective of Adem's (2014) study was to investigate the supply chain risk management practices implemented by power sector

companies in Kenya and evaluate their efficacy in mitigating disruptions within the supply chain. A survey design was employed in this study to examine three firms within the sector. The results of the study indicated that power sector companies had indeed adopted supply chain risk management practices, albeit to varying extents. Contingency planning can be enhanced through the implementation of various measures. These included establishing backup supplies for critical items that are susceptible to disruptions, entering into capacity reservation contracts, and conducting thorough assessments of suppliers' historical records regarding disruptions. It was evident that the aforementioned strategies had not been given due attention. It was determined that power sector companies have experienced disruptions in their supply chains, primarily due to power outages.

2.4.4 Contract Management Practice and Performance

Scholars and researchers hold varying perspectives on the concept of Contract Management. In the study conducted by Rendon (2010), an examination was undertaken to explore the essential elements that contribute to the successful management of government contracts. The study reported findings from a research survey, in which a total of 821 individuals were eligible to participate. Of these, 425 individuals successfully completed the survey, resulting in a response rate of approximately 59%. The study employed purposeful sampling techniques to select contracting officers who were representative of seven departments within the United States Department of Defense (DoD) agencies. The study examined the procurement practices of various DoD agencies, which involve the acquisition of diverse supplies and services. All these agencies adhere to the federal contracting statute as well as the contract management regulations and policies set forth by the DoD. The study identified several critical success factors (CSFs), which encompassed a trained workforce, well-defined organizational processes, effective relationships and communication, collaborative teamwork, stakeholder involvement, strong leadership, and adherence to policies and requirements. The research findings indicated that directing attention towards the identified critical success factors (CSFs) has the potential to enhance the Department of Defense's (DoD) contract and project management capabilities.

The study conducted by Oluka and Basheka (2014) investigated the factors that influence and limit the effectiveness of procurement contract management (CM) in Uganda, specifically from the viewpoint of practitioners. The study also explored the potential impact of these factors on service delivery. The research employed a survey methodology, and the results indicated that several factors contribute to the effectiveness of change management (CM). These factors include the establishment of well-defined processes, the development of comprehensive CM plans, the utilization of suitable approaches to capture important insights from CM processes, and the accurate delineation of roles and expertise within CM. The constraints encompassed various factors, such as the absence of political determination to effectively oversee contractual agreements, insufficient organizational capabilities, and a dearth of ethical conduct. The study conducted by Mutua, Waiganjo, and Oteyo (2014) aimed to examine the impact of contract management on the performance of outsourced projects within medium-sized manufacturing enterprises located in Nairobi County, Kenya. The research conducted on medium manufacturing enterprises examined various factors that impact contract management, including project objectives, dispute resolution mechanisms, and project acceptance criteria. The study additionally revealed that project team members deemed training in contract management to be of significance.

Nguyen (2013) conducted an evaluation of contract lifecycle management (CLM) specifically within the sell-side context, focusing on a case study within the upstream oil and gas industry. The present study investigated the fundamental principles of Computerized Learning Management (CLM) and the essential components comprising a CLM system. Data was collected using both qualitative and quantitative methods. The study's results indicated that the essential components of CLM encompass processes, individuals, and support systems, while the limitations encompassed contract visibility and technological capability. The research findings indicated that the utilization of CLM demonstrated efficacy in the management of risks, compliance, and change.

In a study titled "Determining Contract Management Professionalism within Rijkswaterstaat," Hotterbeekx (2013) conducted an analysis to assess the level of

professionalism exhibited by contract management functions within the organization. The objective of the analysis was to identify areas for improvement and enhance the overall effectiveness of the contract management function. The study aimed to assess the quality of contract management (CM) by utilizing the contract management maturity model. This model evaluated the procedures, mechanisms, and implementation of CM processes by conducting a comparative analysis of four organizations. The study employed a diagnostic framework that specifically examined the utilization of procedures, mechanisms, and the overall quality of change management activities within a sample of 25 projects. The results indicated that in order to enhance the professionalism of change management, it is necessary to elevate the overall performance level of all functions. The study suggests that it is important to prioritize the evaluation of contract processes and the documentation of essential data and lessons learned from these processes. This is necessary in order to ensure and regulate the quality of contract management activities during implementation. Additionally, providing training and support to contract managers is crucial in establishing a continuous learning cycle that enhances the effectiveness of contract management functions and promotes consistency in their execution.

In a study conducted by Shiwa (2014), the focus was on examining the impact of contract management on the performance of contractors within the context of an oil and gas company. The research employed a case study methodology to investigate the impact of contract management on the health, safety, and environmental (HSE) performance of contractors. Additionally, the study examined the cost effectiveness of contract management during the execution of contracts, as well as the degree to which contract management ensures compliance with contractual obligations. The primary factors contributing to the performance of contractors, as determined by the researcher, include Relationship Management, Contractor Selection, and the Contract Management team. The results of the study indicate that the contract management process demonstrates a high level of efficacy in the monitoring of contractors' performance.

An additional study, which remains unpublished, was carried out at the Tanzania National Roads Agency to assess the efficacy of contract management, as conducted

by Marco in 2013. The factors that have been identified as influencing contract management encompass contract management practices, the legal framework governing contract implementation, and the significance of legal professionals in facilitating effective contract management within the context of public procurement for works in Tanzania. The study employed a case study design. Both qualitative and quantitative methodologies were employed. The primary outcomes of the study indicate that the contract management stage is considered distinct from procurement, with procurement specialists at Tanzania National Roads not actively involved in monitoring contract implementation. The results additionally indicated that inadequate management of contracts has resulted in both cost overruns and delays during the execution of projects.

2.4.5 Procurement Regulations Compliance and Performance

Procurement regulations refer to a set of rules that organizations adhere to when making decisions regarding procurement. According to Sobczak (2008), the study established a quantitative model that identified several guidelines for effective procurement. These rules encompass the development of strong supplier relationships, the adoption of a team-based approach to procurement, and the appropriate utilization of technology. In their study on procurement policies and the implementation of effective procurement practices in tertiary public training institutions in Kenya, Njeru et al. (2014) employed a descriptive research design and collected data from 160 respondents. The study revealed several factors that influence procurement policies and the implementation of effective procurement in tertiary institutions in Kenya. These factors encompassed a low level of compliance with procurement regulations, inadequate adherence to procurement regulations, insufficient support from top management, weak relationships between management and stakeholders, and a lack of an effective policy-making process. The study suggests that institutions should enhance their adherence to procurement regulations and purchasing regulations, implement efficient procurement procedures, strengthen stakeholder relationships, and employ more effective methods for managing organizational resources.

In their 2017 study, Kisang and Kihara examined the impact of sourcing policies on the performance of the public sector in Kenya. Their findings revealed a positive correlation between procurement policies and performance within the public sector. A descriptive survey was employed in this study, targeting a sample of 124 procurement officers situated in the administration headquarters. This study aimed to examine the impact of the lowest bid policy and lean performance policy on the performance of the public sector in Kenya. The variables measured in this study encompassed the eligibility index, criterion metrics, eligibility rating, pull management of inventory, economies of scale, minimal defects and rework, quality improvement, cost reduction, and lead time reduction.

In contrast, Mutai and Chirchir (2015) conducted a separate investigation and discovered that while adherence to purchasing regulations and procedures does facilitate transparency, efficiency, and accountability within organizations, there was no statistically significant correlation between compliance with these regulations and procedures and supply chain performance. The research was conducted on commercial banks located in Kenya, utilizing a cross-sectional survey design. The study was conducted with three primary objectives: firstly, to assess the level of adherence to purchasing regulations and procedures; secondly, to examine the relationship between compliance with purchasing regulations and procedures and supply chain performance; and finally, to identify the challenges encountered in the implementation of purchasing regulations and procedures within commercial banks in Kenya. The study suggests that in order to enhance the efficiency of supply chains in commercial banks in Kenya, it is advisable to allocate resources towards implementing different strategies. Consequently, it is imperative for management to establish purchasing regulations and procedures that clearly outline these strategies, provide detailed guidelines, and specify methods for implementation.

2.5 Critique of Existing Literature Relevant to the Study

Based on empirical evidence, it is evident that there exist reports and academic studies conducted by researchers from different countries, including Kenya, on Supply Chain Management Practices (SCMPs) in diverse organizations. Nevertheless, it is important

to note that there is a lack of universally recognized elements that are commonly acknowledged as optimal practices in the field of supply chain management (Shapiro, 2001). According to Li et al. (2006), certain organizations have acknowledged the significance of incorporating Supply Chain Management Practices (SCMPs). However, these organizations often face challenges in determining the specific components of a comprehensive set of SCM practices, primarily due to a limited understanding of the constituents involved. According to Ibrahim and Hamid (2012), numerous researchers investigating supply chain management practices have employed diverse elements and dimensions of such practices in their studies.

Barasa, Namusonge, and Iravo (2015) conducted a study to examine the impact of supply chain management practices on the performance of Steel Manufacturing Companies in Kenya. The results of the study indicate that the implementation of supply chain management practices, such as supply chain collaboration, green supply chain management, information sharing, and customer relationship management, have a significant impact on the performance of steel manufacturing companies in Kenya. The researchers employed a purposive sampling technique, specifically the judgmental sampling method, to identify and select eligible steel manufacturing companies and the departments to be included in the study. The study involved a purposive sampling of 32 companies out of the total 258 registered steel manufacturing companies in Kenya. The research study involved a sample size of 384 respondents, with each company contributing 12 respondents. The determination of the sample size was contingent upon the researchers' research objectives, the study's purpose, the potential consequences, and the feasibility within the constraints of time and resources. While the utilization of purposive sampling was deemed suitable for determining the sample size of the respondents, it proved to be unsuitable for the selection of companies, as it resulted in the exclusion of certain companies from participating in the study. The study omitted the inclusion of financial performance measures, a crucial indicator of performance within a business context.

The study conducted by Mutuerandu and Iravo (2014) examined the effects of Supply Chain Management Practices on the performance of Haco Industries Limited (Kenya), utilizing a case study approach. Out of the total sample size of 40 questionnaires

distributed, a total of 31 questionnaires were successfully completed and deemed valid, resulting in a response rate of 77.5%. This response rate can be considered satisfactory and indicative of a reliable representation of the population under study. The research revealed that the implementation of supply chain management practices, such as fostering customer relations, establishing strategic partnerships, providing training, and facilitating information sharing, has a favorable impact on the overall performance of the organization. The researchers noted a scarcity of studies examining the knowledge and impact of supply chain management (SCM) practices on organizational performance within Kenyan manufacturing companies. To address this gap, the researcher investigated commonly recommended SCM practices documented in prior research conducted in other countries, including studies by Li et al. (2005), Li et al. (2006), Lori et al. (2011), and others. However, it is worth noting that prior to the current study, several research studies have already been conducted in Kenya, focusing on supply chain management practices in various organizations. Several studies have been conducted on supply chain management (SCM) practices in various industries. For instance, Mogire (2011) examined SCM practices in five-star hotels, Murage (2011) focused on SCM practices in the commercial electricity energy sub-sector in Kenya, and Onyango (2012) investigated SCM practices in the cement industry. These studies, among others, contribute to the understanding of SCM practices in different sectors.

In their study, Guya and Nyamwega (2014) conducted research on the relationship between supply chain management practices and the competitiveness of government agencies within the energy sector in Kenya. This study employed a range of factors, including Strategic Supplier Partnership, Customer relationship, Level of information sharing, Quality of information sharing, Postponement, Outsourcing, Lean Practices, and Green Supply chain practices, to assess the competitive performance of government agencies operating within the energy sector in Kenya. The results of the study indicate that the implementation of supply chain management (SCM) practices has a positive impact on organizational performance, leading to a competitive advantage. The study employed a census research design, encompassing a total of seven companies operating within the energy sector in Kenya. Nevertheless, it should be noted that the number of companies operating in the energy sector of Kenya exceeds

the previously mentioned figure of seven. Consequently, it can be argued that the design of the study was not comprehensive enough to encompass the entire population.

The four supply chain management practices that have been the subject of discussion in this study have garnered attention within the existing body of literature on supply chain management. The existing body of literature pertaining to the association between their relationship and organizational performance exhibits a certain breadth, yet lacks in-depth analysis in certain studies. Conversely, other studies have delved deeper and explored the ways in which firms can effectively develop and implement these practices. In their study titled "Forecasting Practices in Supply Chain Management," Albarune and Habib (2015) conducted an exploratory investigation that centered on the utilization of secondary data to forecast demand management in the field of supply chain management. The study employed various industries, including the lifesaving industry, retail chains, and fast-moving consumer goods (FMCG) industries. The scope of this study encompasses three distinct industries; however, its depth is constrained due to the presence of diverse chain partners within each industry. The research conducted did not utilize primary data, potentially limiting the amount of information that could have been obtained. In their study titled "Demand forecasting and sharing strategies to mitigate fluctuations and the bullwhip effect in supply chains," Barlas and Gunduz (2011) examined the efficacy of information sharing in mitigating undesirable fluctuations. A supply chain system comprising of three stages, each consisting of identical agents, was utilized. The study conducted an in-depth analysis that encompassed various levels of the supply chain.

Chindia, Wainaina, Kibera, and Pokhariyal (2014) conducted a research study that focused on the examination of forecasting techniques, the operating environment, and the accuracy of performance forecasting specifically for large manufacturing firms in Kenya. The research employed a descriptive survey methodology, utilizing a proportionate stratified random sampling technique. The sample size consisted of 217 companies, selected from a population of 487 companies that each had a minimum of 100 employees. This sampling approach was deemed appropriate and effectively represented the population under investigation. The assessment of the APF encompassed various indicators, namely expected value, return on sales, return on

assets, and growth in market share. The findings of the study indicate that in order to attain accurate and reliable accurate prediction of future performance (APF), it is imperative for a forecasting methodology to take into consideration the influence of the operating environment. This encompasses all the stakeholders who have an impact on the functioning of the organizations. Although the study employed managers who potentially possessed a strong understanding of forecasting techniques, the specific departments to which they belonged were not disclosed. Despite variations in parameters and methodologies employed by different researchers, all studies pertaining to supply chain management (SCM) and demand forecasting consistently demonstrate the advantageous nature of forecasting for organizations. Furthermore, it is evident that a lack of coordination in demand forecasting across different levels of the supply chain results in a diminished ability to promptly address customer needs and preferences.

The existing literature on strategic sourcing uniformly agrees that both strategic sourcing and supplier selection significantly influence organizational performance. While certain studies have solely examined the upstream chain, others have taken into account both the upstream and downstream supply chain. The findings of Bildsten's (2015) study were centered on examining the variations in purchasing strategies across diverse organizations and countries. Interviews and observations were conducted in two factories located in distinct countries. The findings of the study indicate that variations in purchasing strategies arise from the specific requirements, anticipated outcomes, and organizational cultures of the companies involved. Nevertheless, certain procurement strategies exhibited similarities, and the investigation focused exclusively on the upstream supply chain. In their study titled "Strategic sourcing and supplier selection in the U.S. textile, apparel retail supply network," Su, Dyer, and Gargeya (2009) conducted an investigation. The results of the study indicate that the implementation of strategic sourcing practices has a notable and favorable impact on the overall performance of businesses. Additionally, the careful selection of suppliers is found to have a significant and positive influence on a firm's ability to attain a competitive advantage.

In a study conducted by Burke (2005), the focus was on examining the sourcing strategy within a supply chain. Specifically, the study explored the relationship between a firm and its suppliers in the upstream direction, as well as the impact of uncertainties in both upstream and downstream activities on the sourcing strategy adopted by firms. The findings indicate that sourcing strategies significantly impact a company's performance, underscoring the importance of conducting a thorough evaluation prior to adopting any particular strategy. The investigation examined both the upstream and downstream supply chains. In their study, Kihanya, Wafula, Onditi, and Munene (2015) discovered that strategic sourcing plays a crucial role in enabling organizations to attain strategic advantage. Similarly, Chepng'etich, Waiganjo, and Karani (2016) conducted a study on the impact of strategic sourcing on the organizational performance of state corporations in Kenya, specifically focusing on Kenya Power. Their findings suggested that one of the recommended strategies for achieving desired performance outcomes is to establish partnerships with suppliers who provide strategic items, among other recommendations.

The existing body of literature pertaining to supply chain risk management is extensive and comprehensive. Numerous scholars have conducted research on various aspects of supply chain risk management, focusing on both the upstream and downstream segments of the supply chain. All of the studies examined in this review employed a survey design, utilizing both qualitative and quantitative methods for data analysis. A survey was conducted by Ouabouch and Pache (2014) among a sample of 158 Moroccan manufacturers. In their study, Kern et al. (2012) administered a survey to a sample of 162 manufacturing companies in Germany, encompassing both large and medium-sized enterprises. In their study, Arani, Mukuru, Waiganjo, and Musyoka (2015) employed a cross-sectional survey design to examine a sample of 62 manufacturing firms in Kenya. The researchers utilized a combination of qualitative and quantitative methods in their data collection process. Despite the utilization of various parameters by scholars, all the studies that have been reviewed concur that risk refers to any unforeseeable event that arises from the initial supplier and affects the end user. If not effectively managed, these risks can have detrimental consequences on organizational performance.

Scholars and researchers hold varying perspectives on the concept of Contract Management. Various designs, approaches, and parameters have been employed in the examination of contract management. In a study conducted by Rendon (2010), a survey-based approach was employed to examine the essential factors contributing to the success of government contract management. The study employed purposive sampling to select a total of 425 participants. In their study, Oluka and Basheka (2014) utilized a survey design methodology to investigate the factors that influence and limit the efficacy of procurement contract management (CM) in Uganda. Nguyen (2013) and Shiwa (2014) conducted case studies to evaluate contract lifecycle management (CLM) in the sell-side of the upstream oil and gas industry and the impact of contract management on the performance of contractors in oil and gas companies, respectively. Despite employing various designs, approaches, and parameters, all researchers unanimously agree that the contract management process is highly effective in monitoring an organization's performance. Additionally, it is widely acknowledged that professionalism and teamwork are crucial for successful contract management. Conversely, inadequate contract management has been found to result in cost overruns and project implementation delays.

The Energy Policy of Kenya aims to ensure the provision of sufficient, affordable, accessible, and reliable electricity to both businesses and households in the country (GoK, 2019). Consequently, it is necessary to implement supply chain practices that can effectively facilitate the attainment of these objectives. The study conducted by Murage (2011) examined the adoption of Supply Chain Management Practices within the utilities of the commercial electricity energy sub-sector in Kenya. The study primarily examined the most pertinent supply chain management (SCM) practices that directly impact the operational efficiency and effectiveness of both individual operations and the overall supply of electricity in the energy sub-sector. The findings of the study indicate that although there has been a development of a framework involving both private and public ownership within the electricity energy sub-sector supply chain, the Government continues to adopt a regulatory approach towards enterprises in the traditional public sector. This raises the concern regarding the varying supply chain practices employed by different stakeholders, despite their shared goal of ensuring sufficient power energy within the nation. The research employed a

census survey methodology. Nevertheless, it is worth noting that the sample size of the respondents was limited to only 9 individuals, potentially raising concerns about the adequacy of its representativeness.

2.6 Research Gaps

Research conducted on Supply Chain Management Practices (SCMPs) reveals that this concept has been in existence for several decades. Numerous scholars investigating supply chain management practices have employed diverse elements and dimensions within their studies. Based on a comprehensive analysis of existing literature and empirical research, it becomes evident that a considerable number of studies pertaining to Supply Chain Management Practices (SCMPs) have been carried out in various countries, encompassing both developed and developing nations. Several studies have been conducted to examine the relationship between supply chain management practices and supply chain performance in various industries and countries. For instance, Hove, Pooe, and Mathu (2015) investigated the influence of supply chain management practices on supply chain performance in South Africa.

Similarly, Mensah, Diyuoh, and Oppong (2014) assessed the supply chain practices and their impact on the performance of Kasapreko Company Limited in Ghana and Nkunda, Kazungu and Changalima (2023) evaluated Procurement Regulations as a basis for public entities to embrace collaborative procurement practices in Ghana. Watiri and Kihara (2017) examined the influence of supply chain practices on competitive advantage in the cement manufacturing industry, specifically focusing on the case of Portland Cement Company Limited in Kenya. Barasa, Namusonge, and Iravo (2015) explored the contributions of global supply chain management practices on the performance of steel manufacturing companies in Kenya. Kimechwa, Njeru, and Mutua (2015) investigated the impact of supply chain management practices on the performance of banks in Kenya. In their study titled "Impact of Supply Chain Management Practices on Organizational Performance: A Case Study of Haco Industries in Kenya," Mutuerandu and Iravo (2014) examined the relationship between supply chain management practices and the performance of Haco Industries, while Matunga, Ngugi and Odhiambo (2023) explored Procurement Practices and Level of

Implementation of Public Procurement Regulations in the Devolved Systems of Government in Kenya along with other relevant cases. The aforementioned studies have not specifically examined the impact of supply chain management practices (SCMPs) on the operational efficiency of the electricity energy sub-sector's supply chain.

The existing body of literature indicates that while there has been research conducted on the energy sector in Kenya, there is a limited focus on the specific area of supply chain management practices. There is a lack of available data regarding studies conducted to ascertain a more comprehensive understanding and the impact of Supply Chain Management Practices (SCMPs) on the operational effectiveness of companies operating within the Electricity energy sub-sector in Kenya. One of the studies that examines the energy sector was carried out by Augustine, Ronoh and Essandoh (2021). The study conducted a comprehensive review of energy scenario and sustainable energy in Kenya. Guya and Nyamwega (2014) focused on the relationship between supply chain management practices and the competitiveness of government agencies within the energy sector in Kenya. The study conducted by Murage (2011) examined the supply chain management practices implemented by utilities operating in the commercial electricity energy sub-sector in Kenya.

Chepng'etich, Waiganjo, and Karani (2016) conducted a study to examine the impact of strategic sourcing on the organizational performance of state corporations in Kenya, specifically focusing on the case of Kenya Power. Similarly, Oromo and Mwangangi (2017) investigated the influence of supplier development on procurement performance in the public sector in Kenya, with a specific focus on the case of Kenya Electricity Generating Company Limited (KenGen). Additionally, Kitungu and Nyamwega (2014) explored the relationship between supply chain factors and the successful delivery of power generation projects at Kenya Electricity Generating Company Limited. The majority of these studies were conducted as case studies.

Various studies and reports have focused on the electricity energy sub-sector, specifically examining the impact of reforms within this sector and the experiences of Independent Power Producers (IPPs). Several studies have examined the impact of

electricity energy sub-sector reforms on sector performance. Wangari (2014) conducted empirical research to investigate the effects of these reforms on the demand, efficiency, and accessibility of electricity energy in Kenya. The study explored the various methods employed to reform the energy sector, including the restructuring of the power sector. Similarly, Karekezi and Kimani (2004) examined whether power sector reforms have led to increased access to electricity energy among the impoverished population in East Africa.

The GOK (2015) discusses the Power Sector medium term plan 2015 – 2020 of Kenya vision 2030, while Seth and Scott (2013) examine the political economy of electricity energy sub-sector distribution in developing countries, among other relevant sources. There is a lack of empirical research examining the relationship between strategic corporate social responsibility (SCMPs) and firm performance within the context of the electricity energy sub-sector. This study thus aimed to address this research gap. This study examined the impact of various practices, including demand forecasting, strategic sourcing, supply chain risk management, and contract management, on the performance of firms operating in the electricity energy sub-sector. Additionally, the study explored the role of procurement regulations compliance as a moderating variable.

2.7 Summary

In a nutshell this chapter presented a comprehensive literature review on the impact of supply chain management practices on the performance of firms operating in the electricity energy sub-sector. Numerous scholars have put forth a range of Supply Chain Management Practices (SCMPs) that have an impact on firm performance. These practices encompass a variety of factors, such as healthy partnering, sharing of risks and benefits, integration of resources, processing of information, sharing of information, capturing of knowledge, coordination of social interactions, making strategic decisions, resolving conflicts, and motivating employees. In order to gain insight into performance and its associated variables, as well as the interconnections among them, this study has incorporated five theories: systems theory, strategic choice

theory, and supply chain network theory. The relational contract theory and supply chain operations reference (SCOR) model.

A theoretical framework has been proposed to conceptualize the interrelationships among variables in the research. The variables employed in this study are considered to have an impact on the performance of firms operating in the electricity energy sub-sector in Kenya. These variables have been extensively examined in existing literature and have been found to have a positive effect on firm performance when effectively managed. The variables encompassed in this study comprise demand forecasting, strategic sourcing, supply chain risk management, and contract management. The compliance with procurement regulations is considered to be a moderating variable.

The review has additionally determined that numerous studies conducted in both developed and developing nations have examined supply chain management practices across various industries. However, there is a noticeable scarcity of reports or data regarding supply chain management practices and firm performance specifically within the electricity energy sub-sector in Kenya. Based on a comprehensive analysis of theoretical and empirical literature, it becomes apparent that there is a need for further investigation into the relationship between supply chain management practices and firm performance within the electricity energy sub-sector in Kenya. This research endeavor seeks to expand upon the current body of knowledge in this domain.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides an overview of the philosophical underpinnings of the study, followed by a discussion of the research design, target population, sampling frame, sample size, and sampling strategies. The chapter also delves into the research instrument, data collecting procedure, and pilot study, concluding with a discussion on data analysis along with presentation.

3.2 Research Philosophy

The research philosophies outline the research design process. Research philosophy is the underlying assumption upon which research and development in the field of inquiry is based (Wood & Ross-Kerr, 2016). The dominant philosophical orientations in social sciences are phenomenology and positivism (Leedy & Ormrod, 2016). This study adopted positivism research design. Positivism is said to be in the realm of theory, where the data is theory driven and research design is utilized to test the accuracy of the theory (Salmons, 2016). Positivistic philosophy support testing of study hypothesis on the existence of significant relationship between study variables.

Further, positivism philosophy was chosen as the researcher in the study was independent and objectives of the study were measured to determine social reality aspect. The study was based on empirical testing of theory of the study as it focused on generalization and abstraction while concentrating on description and explanation of the study based on research themes or variables. Positivism was also chosen as the study research methodology was characterized by survey sample, use of questionnaire as data collection tools as well as application of statistical model for research analysis. Also, the philosophy was used to examine the relationship between supply chain management practices and the performance of firms in electricity energy sub-sector in Kenya. The choice of philosophy was based on the fact that it hypothesized the study and made it possible to generalize the study findings. The role of the researcher was to

provide data or information required and avoided personal experience and focused on research informed by value free aspect.

3.3 Research Design

The study used cross-sectional survey research design. Cross-sectional survey research design is a research design for conducting research that involves collecting, analyzing and integrating quantitative and qualitative approaches (Plano & Ivankova, 2016). The design was appropriate as it help in collecting of quantitative and qualitative data. The design was also chosen as it helps in collecting data on facts and described the current status of supply chain management practices and performance of firms in electricity energy sub-sector. Descriptive research design is a scientifically plausible method that allows a researcher to collect data from relatively large population within a short period (Creswell, 2013). The research design assists in further identifying study variables that may warrant further studies. Watiri and Kihara (2017) used descriptive design in their study successfully.

3.4 Target Population

The target population for this study was fifteen (15) firms in electricity energy sub-sector which had been connected to the grid between the year 2013 to 2017, one exploration firm, one transmission firm and one distribution firm as was provided by Energy and Petroleum Regulatory Authority (EPRA) (2017). 6052 employees from whom the unit of observation was derived, were drawn from the 15 firms in the electricity energy subsector in Kenya. The unit of observation used was drawn from Procurement, warehousing/storage, distribution/marketing, research and development and Finance departments of the firms under study.

3.5 Sampling Frame

A sampling frame is a complete listing of all the units of the population which is purposely used to draw random samples (Mugenda & Mugenda, 2003). The sampling frame of this study was the employees from four public companies and eleven

independent power producers (IPPs) firms which had been connected to the grid in the year 2011 to 2017 as was provided by EPRA (2017).

Table 3.1: Sampling Frame

Company Name	Population
Kenya power and lighting company	1500
Kenya generating company	2407
Geothermal development company	700
Kenya transmission company	300
Lake Turkana wind power	500
IberAfrica power	110
Tsavo power	100
Bidco	150
Rabai power	70
Triumph power	52
Opower 4	28
Mumias sugar	30
Gulf power limited	45
James Finley	40
Imenti factory	20
Total	**6052**

Source: Energy and Petroleum Regulatory Authority (2017)

3.6 Sample Size and Sampling Techniques

The total number of employees working in these companies was 6052 (EPRA, 2017). The sample size of all the employees that was used in this study was arrived at by applying the formula of Taro Yamane (1967) as cited in (Ukpong & Udofia, 2011) as shown below:

$$n = \frac{N}{1+N(e)2}$$

Where:

n = sample size

N = Total number of employees

e = limit of tolerable error (0.05)

Hence, $6052/1+ 6052 \times 0.05^2 = 375$ employees.

Since the companies are not homogeneous in terms of employees, they were proportionately allocated sample sizes for different strata (companies) from the given sample of 375 by applying the formula, n_i = N1/N*n provided by Kothari (2009). Where n_i is the sample size from the stratum, N1 is the total population in the stratum, N is the total population in the entire study and n is the total sample size of the study. Given that the firms have many departments, a sample of the department that was to participate in the study was sampled purposively from the departments that are mostly involved in the supply chain functions (Procurement, warehousing/stores, distribution/marketing, research and development and Finance) in the sampled firms (The findings are presented in table 3.2). This was because the researcher believed that employees from these departments would give the correct responses needed concerning SCMPs and the performance of firms in electricity energy sub-sector in Kenya. The respondents were drawn using random numbers.

Table 3.2: Sample Size

Management Level	**Population**	**Sample Size**	**Percent**
Kenya power and lighting company	1500	93	25
Kenya generating company	2407	149	40
Geothermal development company	700	43	11
Kenya transmission company	300	19	05
Lake Turkana wind power	500	31	08
IberAfrica power	110	07	02
Tsavo power	100	06	02
Bidco	150	09	02
Rabai power	70	04	01
Triumph power	52	03	01
Orpower 4	28	02	0.5
Mumias sugar	30	02	0.5
Gulf power limitedJames	45	03	01
Finley	40	03	01
Imenti tea factory	20	01	0
Total	**6052**	**375**	**100**

3.7 Research Instruments

Both primary and secondary data collection methods were applied in this study. Primary data in this study was collected using a questionnaire. The questionnaire was most appropriate for the ability to be easily administered, completed and analyzed (Creswell, 2011). Valid and detailed questions about the supply chain management practices and electricity energy sub-sector performance were structured. The open-ended questions permitted greater depth of response when a personal response was needed. O'Donoghue and Punch (2003) maintain that open ended questions give respondents freedom to express their views, opinions and make suggestions. Through this, they provided the researcher with written essay accumulation of data. Where the researcher did not administer the questionnaire personally, close supervision and follow up was ascertained to ensure consistency in the interpretation of questions in a bid to reveal the situation on the ground and in line with the study objectives.

The questionnaire had three sections; the first section dealt with the demographic information about the electricity energy sub-sector institutions and their employees. This section helped in providing data for company operation duration and employee experience with the company. Section two contained information about variables responsible for the performance of the electricity energy sub-sector in Kenya, the moderating variable and the performance variable. Finally, section three inquired about the challenges firms in electricity energy sub-sector were facing and the remedies that may be implemented to increase the performance the firms. To get grounding on influence of independent variables and the moderating variable on performance of firms in electricity energy sub-sector, the researcher analyzed the available documents using the document analysis guide (Appendix II).

3.8 Data Collection Procedure

Upon being cleared by the supervisors through the Faculty of Research Examining Board committee, the researcher endeavoured to seek introduction letter from JKUAT and the permit from National Commission for Science, Technology and Innovation (NACOSTI). The permit formed the basis for seeking permission to carry out research from electricity energy sub-sector primary sources, various public and private

electricity energy sub-sector producers, transmitter and distributor. Before conducting the data collection exercise, the letter of request was issued to the company chief executive officer (CEO) to request visiting various employees in the sampled departments. The respondents were first briefed thoroughly concerning the purpose and the subject of study during the material day of data collection and were requested to participate in the exercise voluntarily. The data was collected through the help of research assistant after going through training on how to collect data.

3.9 Pilot Study

Before conducting the actual study, a pilot test was done to detect weaknesses in design and instruments and provide small scale data for selection of a probability sample (Johnson& Christensen, 2010). A pilot test was done prior to the main study to determine the accuracy of the research instrument in obtaining the required data (Mugenda & Mugenda, 2003). The results from the pre-test was analyzed using SPSS to establish the internal consistency of items in each of the independent variables. Cronbach's Coefficient Alpha value 0.7 was the minimum acceptable for reliability measure (Nunnally, 1978). This was to determine how the questionnaire items correlated among themselves. The pilot test results were used to improve the research questionnaire. Saunders et al. (2012) indicates that the ideal pilot study can be computed by taking 10% of the sample size. The sample population was 375 hence the pilot sample size was 38. The sample for piloting did not form part of the research respondents.

3.9.1 Validity of Instruments

Mugenda and Mugenda (2003) define validity as the degree to which results obtained from the analysis of the data actually represent the phenomenon under study. Validity also refers to the degree to which an instrument measures what it purports to measure (Mugenda, 2008). It therefore concerns the meaningfulness of research components. This study adopted construct and content validity. Construct validity refers to how well a concept, an idea, or behavior is translated into a functioning and operating reality (Trochim, 2006). Construct validity was achieved through restricting the questions to conceptualized variables and ensuring that indicators of each variable fell within the

same construct. The purpose of this check was to ensure that each measure, adequately assessed the construct it purported to assess. Content validity was tested by formulating a questionnaire and operationalizing it as per the study variables. This ensured adequacy and representativeness of the items in each variable in relation to the purpose and objectives of the study. It was also verified through expert opinions from supervisors and supply chain practitioners.

3.9.2 Reliability of Instruments

Reliability is the degree to which an instrument consistently measures the objective of the research (Babbie, 2010). Reliability of the instruments help to determine any error and rectify the instruments before the actual study (Zikmund, 2003). The study focused on the right sample to minimize the error. In addition, the internal consistency of the instruments was determined by applying the Cronbach's alpha technique. Preference for that technique was based on its strength of determining internal consistency of Likert scale continuous based choices, an advantage that is hardly achieved by other methods of determining internal consistency. Normally the Cronbach's alpha reliability coefficient ranges between 0 and 1. However, the closer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the Likert scale. According to Jacobs & Sorensen (2011) the minimum value of the Cronbach's alpha coefficient is 0.7. The Cronbach formular is shown below;

$$\alpha = \frac{N\overline{c}}{\overline{v} + (N-1)\overline{c}}$$

Where: N = number of items, $\overline{c}$ = average inter-item covariance among the items and $\overline{v}$ = the average variance.

3.10 Data Analysis and Presentation

The returned and duly filled questionnaires were verified, coded and tallied according to the themes and thereafter analyzed quantitatively and qualitatively. The study applied quantitative technique for data processing, analysis and interpreting the findings. Data was collected, coded and entered in Statistical Package for Social Science (SPSS) version 28 for analysis. The descriptive analysis was employed.

Frequencies, means and standard deviation were generated. Means measured central tendency while standard deviation measured dispersion. Finally, inferential statistics was carried out to explain the relationship of the independent variables SCMPs and the performance of firms in electricity energy sub-sector in Kenya.

3.11 Diagnostic Tests

The study carried out the following diagnostic tests as explained in the sections that follow.

3.11.1 Normality Test

Normality is important in knowing the shape of the distribution and helps to predict dependent variables scores (Paul & Zhang, 2009). Normality of data distribution was tested by use of Shapiro Wilk Test. The Shapiro–Wilk test is a test of normality in frequentist statistics. The null- hypothesis of this test is that the population is normally distributed. Therefore, if the p-value is less than the chosen alpha level, then the null hypothesis is rejected as there is evidence that the data tested are not from a normally distributed population. Such as the data are not normal. On the other hand, if the p-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected (Sharpiro & Wilk, 1965).

3.11.2 Heteroscedasticity Test

Heteroscedasticity is a situation in which the variance of the dependent variable varies across the data, as opposed to a situation where Ordinary Least Squares, OLS, makes the assumption that $V(\varepsilon j)=\sigma^2$ for all j. It is tested by performing the Breusch-pagan test. This is where the null hypothesis error variances are all equal verses the alternative that the error variances are a multiplication function of one or more variables. Homoscedasticity is evidence when the value of “pro>Chi-square”>0.05

(Park, 2008).

3.11.3 Autocorrelation Test

The correlation of a time series with its own past and future values (Box & Jenkins, 1976). The autocorrelation function can be used to detect non-randomness in data and also to identify an appropriate time series model if the data are not random. Autocorrelation is essentially a correlation coefficient, but instead of correlation being between two different variables, the correlation is between two values of the same variable at times Xi and Xi+k.

3.11.4 Multicollinearity Test.

Multicollinearity is the undesirable situation where the correlations among the independent variables are strong (Martz, 2013). To test for multicollinearity, Variance Inflation Factor (VIF) was used. If no two independent variables are correlated, then all the VIFs is to be 1. If VIF for one of the variables is around or greater than 10, there is multicollinearity associated with that variable. In such a case one of the variables has to be removed from the regression model (Straud, 2003).

3.12 Inferential Statistical Analyses

Pearson correlation, linear and multiple regression analysis was applied for investigation (Zikmund, 2003). (Zikmund, 2003). According to Mugenda and Mugenda (2003) multiple regression analysis attempts to determine whether a group of variables together predict a given dependent variable and, in this way, attempt to increase the accuracy of the estimate. The multiple linear regression model for this study was:

$$\mathbf{Y} = ß_0 + ß_1\mathbf{X_1} + ß_2\mathbf{X_2} + ß_3\mathbf{X_3} + ß_4\mathbf{X_4} + \varepsilon$$

For testing the moderating effect, the following model was used:

$$\mathbf{Y} = ß_0 + ß_1\mathbf{X}_1M + ß_2\mathbf{X}_2M + ß_3\mathbf{X}_3M + ß_4\mathbf{X}_4M + \varepsilon$$

Where:

Y= Performance of firms in electricity energy sub-sector

β_0=constant (Slope) of the Model

$ß_0$, $ß_1$, $ß_2$, $ß_3$, and $ß_4$ are the regression coefficients to be estimated

X_1 is Demand forecasting practice

X_2 is Strategic Sourcing practice

X_3 is Supply chain risk management practice

X_4 is Contract management practice

M is Procurement Regulations Compliance (Moderating variable)

ε = error term

The variable Y was the dependent variable which was measured by the revenue generation, order cycle time and customer satisfaction. This variable depended on the independent variables performances that are represented by X_1, X_2, X_3 and X_4. The variables were measured by consumption data, sharing of information with trade partners, communication systems and environmental scanning, sourcing decisions, selection criteria, supplier base, negotiation approaches, risk management methods, sources of risks, risk mitigation strategies, risk drivers and consequences, team structures communication systems, managing performance and contract administration. The $ß_1$, $ß_2$, $ß_3$, and $ß_4$ were the coefficients of variation that measured the magnitude of the relationship of the variables X_1, X_2, X_3 and X_4 as they contributed

the performance of firms in electricity energy sub-sector. The constant ($ß_0$) indicated the variables that were not within the model but were important in measuring the performance of firms in electricity energy sub-sector that might not have been captured in this model. M was the moderating variable which may have affected the strength of the relationship between dependent variable and independent variables. Finally, the (ε) was the error term that described the errors that might have been caused during the sampling and data analysis since the researcher used the confidence level of 95 %. The qualitative data was categorized into themes that were analyzed using content analysis. These themes helped support the findings from the quantitative data obtained from the questionnaire and enhanced the recommendation.

3.12.1 Operationalization of Variables

This study used the rating scales and open-ended questions which allowed the respondents to add information that might not have been included in the closed-ended questions. The study used the likert scale that was developed by Rensis Likert, to examine how strongly subjects agreed or disagreed with a statement (Cooper & Schindler, 2011). In this study, Likert scales dominated the questionnaire. A Likert Scale can be evaluated easily through standard techniques like, factor analysis and logistic regression analysis (Montgomery, Peck & Vining, 2001). All the hypotheses were measured in regression model to test the relationship between supply chain management practices and performance of firms in electricity energy sub-sector.

Table 3.3: Measurement of Study Variables

Variable	Indicator	Scale	Questionnaire Reference/ Measurement
Demand forecasting practice	• Consumption data • Sharing information with trading partner • Communication systems • Environmental scanning	Interval	Questions (a-b)
Strategic sourcing practice	• Sourcing decisions • Selection guidelines • Supplier base • Negotiation approaches	Interval	Questions (a-c)
Supply chain risk management practice	• Risk management methods • Sources of risks • Risk mitigation strategies • Risk drivers and consequences	Interval	Questions (a-c)
Contract management practice	• Team structures • Communication systems • Managing performance • Contract administration	Interval	Questions (a-c)
Procurement Regulations Compliance	• Transparency • Accountability	Interval	Questions (a-b)
Performance of electricity energy sub-sectorfirms	• Revenue generation • Order cycle time • Customer satisfaction	Interval	Questions(a-c)

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents research findings and discussion as per study objectives; to determine the influence of demand forecasting on the performance of firms in electricity energy sub-sector in Kenya; to find out the influence of strategic sourcing on the performance of firms in electricity energy sub-sector in Kenya; to establish the influence of supply chain risk management on the performance of firms in electricity energy sub-sector in Kenya; to evaluate the influence of contract management on the performance of firms in electricity energy sub-sector sub-section in Kenya and to determine the moderating effect of procurement regulations compliance on the performance of firms in electricity energy sub-sector in Kenya.

4.3 Response Rate

A total of 375 questionnaires were distributed, with 317 of them being completed and returned, resulting in a response rate of 84.5%. Mugenda and Mugenda (2003) assert that a response rate of 50 percent is deemed sufficient for analysis, while a rate of 60 percent is considered favorable, and a response rate exceeding 70 percent is regarded as exceptional.

Table 4.1: Response Rate

Response rate	Sample size	Percent
Returned questionnaires	317	84.5
Un-returned questionnaires	58	15.5
Total	**375**	**100**

4.3 Pilot Study Findings

According to the findings of Wijk and Harrison (2013), the inclusion of pilot studies in a research thesis can enhance its overall value and enhance the reliability of the research findings. The accomplishment of this objective is accomplished through the preliminary testing of the instrument on a limited sample of individuals who possess

similar characteristics to those included in the primary study but are not part of the primary study itself (Watson, Atkinson, & Rose, 2007). According to Saunders et al. (2009), an optimal pilot study can be determined by calculating 10% of the sample size. The participants of this pilot study were selected from the Rural Electrification and Renewable Energy Corporation (RERE), who were not included as research respondents but were representative of the overall population. The initial population consisted of 375 participants, resulting in a pilot sample of 38 employees selected from various departments including Procurement, Warehousing or Storage, Distribution or Marketing, Research and Development, and Finance.

4.3.1 Validity of the Research Instrument

According to Ghauri and Grohaug (2005), the concept of validity is concerned with ensuring that the measurement instrument effectively captures the intended concept. This is achieved by including a sufficient number of items that operationalize the concept, differentiating these items based on an appropriate criterion, and ensuring that the measurement aligns with the theories underlying the test's development. According to Calitz (2009), conducting a pilot test of an instrument can assist in the identification of questions or techniques that are unclear, ambiguous, awkward, or offensive. Certain inconsistencies were observed in certain questions, prompting the need for necessary modifications. The construct validity was ensured by limiting the items in the questionnaire to the specific conceptual framework, variables, and indicators that were defined and directed by the theories and literature evaluated.

4.3.2 Reliability Findings

DeVon (2007) defines reliability as the ability of a questionnaire to consistently measure an attribute and how well the items fit together, conceptually. The reliability of study instruments was conducted to check the extent the measurements were able to yield consistent results each time they were applied under the same conditions or circumstances as asserted by (Sekaran, 2003). The Cronbach's alpha measure of internal consistency was used to test how closely related a set of items are as a group. The Cronbach’s alpha coefficients ranged from 0.795 to 0.925.

Table 4.2: Reliability Results of Research Instruments

Variable	No. of items	Alpha (α)	Comment
Demand forecasting	5	0.795	Reliable
Strategic sourcing	6	0.912	Reliable
Supply chain risk management	5	0.877	Reliable
Contract management	6	0.909	Reliable
Procurement Regulations Compliance	4	0.872	Reliable
Performance	4	0.925	Reliable

The results indicated that all scales had Cronbach's alpha indicators that exceeded the test value of 0.70. As explained by Cronbach and Shavelson (2004), Cronbach Alpha Coefficient of above 0.7 implies reliability of the data collection instrument. Table 4.2 presents a summary of the results of the Cronbach's alpha. From the Table, it is inferred that all the questions met the Cronbach's Alpha Coefficient of assessing the internal consistency of the instruments with alpha coefficients of above 0.7 which therefore implies reliability.

4.4 Demographic Characteristics of Respondents

The study sought the demographic characteristic of the respondents as provided and the results were as follows: -

4.4.1 Working Experience

Respondents were asked to indicate the number of years they had worked.

Table 4.3: Working Experience

Years of work	Frequency	Percent
1-5 years	29	9
6-10 years	95	30
11-15 years	57	18
above 15 years	165	52
Total	**317**	**100**

From Table 4.3 majority 52% of the respondents had a working experience of over 15 years and 9% had worked between 1 and 5 years. Raghavan and Janardhanan, (2019) in their study "Investigating Employees' Tenure and Performance among Middle Managers: The Moderating Role of Psychological Empowerment" found out that the longer the duration of the employees' tenure in an organization the higher their job

performance. Majority of the respondents having worked for over 15 years therefore implied that they had thorough understanding of their work environment, work procedures, work policies, and other dynamics of their work requirements. This helped in making dependable forecasts, sound strategic sourcing decisions and employing sound techniques in risk and contract management. According to Ng and Feldman (2010), employees who have served an organization for a long time generally have greater in-role performance.

4.4.2 Respondents Level of Education

Respondents' level of education was sought as shown in Table 4.4.

Table 4.4: Level of Education of Respondents

Level of education	Frequency	Percent
Secondary	10	3
Diploma	178	56
Undergraduate	95	30
Masters	25	8
Professional certificate	10	3
Total	**317**	**100**

The result showed that majority, 56 percent of the respondents indicated that they have a diploma certificate while sizeable 30 percent possess undergraduate degree, 8 percent have master's degree and additional professional and secondary education certificate were indicated by a low number of 3 percent each (The findings are presented in table 4.4). This was highly expected since the respondents were drawn from all levels of management namely; lower, middle and top management levels where the skills, knowledge and competencies are varied. The highly educated held managerial positions responsible for strategic decisions meant to enhance performance. Yaseen, Naas and Micheal (2023) in their study on the relevance of educational qualifications to a job performance among academic administrators in a university found that, the level of qualifications positively affect performance.

4.5 Diagnostic Test Findings

When the assumptions of the linear regression model are correct, ordinary least squares (OLS) provides efficient and unbiased estimates of the parameters (Long & Ervin, 2000). To ensure that there was no violation of the assumptions, this study tested for multicollinearity, heteroscedasticity, autocorrelation and normality test.

4.5.1 Multicollinearity Test

To determine whether multicollinearity existed, collinearity test was conducted using, tolerance, and variance inflated factor (VIF). According to Straud (2012) collinearity Statistics shows the extent to which there is multicollinearity between the variables. If the value for the Tolerance is close to 1 and the value of the VIF is less than 10 for each independent variable, then there is no cause for concern.

Table 4.5: Multicollinearity Test Results for the Study of Independent Variables

	Collinearity Statistics	
Model	**Tolerance**	**VIF**
Demand Forecasting Practice	.816	1.226
Strategic Sourcing Practice	.890	1.124
Supply Chain Risk Management Practice	.845	1.183
Contract Management Practice	.757	1.321

The VIF values found in Table 4.5 show that, there was no multicollinearity problem among the independent variables, since they had a tolerance that was closer to 1 and a VIF value less than 10 ruling out the possibility of multicollinearity.

4.5.2 Heteroscedasticity Test

Heteroscedasticity was tested by performing the Breuch-pagan test. Heteroscedasticity is a situation where the variability of a variable is unequal across the range of values of a second variable that predicts it. Breusch-Pagan test the null hypothesis that the error variances are all equal versus the alternative that the error variances are a multiplicative function of one or more variables Homoscedasticity will be evident when the value of "Prob > Chi- square" is greater than 0.05 (Park, 2008).

Table 4.6: Breusch-Pagan Test for Heteroscedasticity Breusch-Pagan and Koenker Test Statistics and Sig-Values

	LM	Sig
BP	1.459	.918
Koenker	4.013	.548

Null hypothesis: heteroskedasticity not present (homoskedasticity)

The results show that the constant variance (Chi-square= 1.459) is insignificant (P = 0.918). The findings are presented in table 4.6. Thus, we fail to reject the null hypothesis and conclude that the error variance is equal thus heteroscedasticity is not a problem in the data.

4.5.3 Autocorrelation Test

Autocorrelation was tested using Durbin Watson test. This tested whether there is a (linear) correlation between the error term for one observation and the next. A Durbin Watson test value (d) takes on values between 0 and 4. A value of d = 2 means there is no autocorrelation. A value substantially below 2 (and especially a value less than 1) means that the data is positively autocorrelated, such as on average a data element is close to the subsequent data element. A value of (d) substantially above 2 means that the data is negatively auto correlated, such as on average a data element is far from the subsequent data element. Based on the results the Durbin Watson test value (d) was 2.001(close to two) and therefore implied that there was no autocorrelation. The findings are presented in table 4.7.

Table 4.7: Autocorrelation Test

Model	Durbin-Watson
1	2.001

Predictors: (Constant), Demand Forecasting, Strategic Sourcing, Supply Chain Risk Management, Contract Management
Dependent Variable: Performance Electricity energy sub-sector value chain

4.5.4 Normality Test

Normality of data distribution was tested by use of Shapiro Wilk Test. The Shapiro–Wilk test is a test of normality in frequentist statistics. The null- hypothesis of this test is that the population is normally distributed. Therefore, if the p-value is less than the chosen alpha level, then the null hypothesis is rejected as there is evidence that the data tested are not from a normally distributed population. Such as the data are not normal. On the other hand, if the p-value is greater than the chosen alpha level, then the null hypothesis that the data came from a normally distributed population cannot be rejected (Sharpiro & Wilk, 1965). The tests results showed that the p-values for the variables were > 0.05. The findings are presented in table 4.8 implying that the sample data was significantly normally distributed.

Table 4.8: Test of Normality

Variables	Shapiro-Wilk Statistic	df	Sig.
Demand Forecasting	.971	317	.171
Strategic Sourcing	.974	317	.229
Supply Chain Risk Management	.966	317	.098
Contract Management	.986	317	.731
Performance	.965	317	.088
Procurement Regulations Compliance	.990	317	.910

4.6 Influence of Demand Forecasting Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

4.6.1 Demand Forecasting Practice Descriptive Statistics Findings

The study sought respondents' opinion on influence of demand forecasting on the Performance of firms in electricity energy sub-sector in Kenya based on the following scale: 5 SA=strongly agree, 4 A=agree, 3 N=neutral, 2 D=disagree, 1 SD=strongly disagree. A standard deviation of more than one implied a significance difference in respondents. The results were as shown in Table 4.9.

Table 4.9: Demand Forecasting Practice Statistics Findings

Opinion statements	Mean	Std. Deviation
Consumption ratedata is shared throughout electricity energy sub-sectorsupplychain	3.646	1.08
There is sharing of information with trade partners	3.35	.84
Organizations communication systems are duly integrated for effective sharing of forecast information	3.637	1.21
Collaborations with supply chainpartners create amore accurate forecast	3.615	0.92
Firms scan operating environment in order to conduct accurate forecasting	4.05	0.889

From the findings majority of the respondents strongly agreed that their firms scan the operating environment in order to conduct accurate forecast with a M of 4.05 and a SD of .89. This finding concurred with Sindelár (2016) who posited that forecasting with statistical methods alone can falter because of the volatility in the everyday business environment. This finding is also in agreement with the findings of Chindia, Wainaina, Kibera and Pokhariyal (2014) who noted that to achieve the accuracy of forecasting technique, the effects of operating environment should not be ignored. Haria (2016) had similar finding where the study revealed that macro environment factors such as political, consumer purchasing power and the weather among others have an impact on forecasting.

The respondents also agreed that, consumption rate data is shared throughout electricity energy sub-sector supply chain and organisations communication systems are closely integrated for effective sharing of forecast information with a M of 3.64 and 3.63 and a SD of 1.08 and 1.21 respectively. These findings concurred with Yan and Wang (2012) who found out that matching the demand and supply in a real-time manner is possible if firms in a supply net share forecast information. The finding also agreed with Albarune and Habib (2015) who posited that forecasting is the key driving factor in planning and making decisions in SCM as well as at the enterprise level. Fliedner (2014) also noted that the development of electronic communication technology enables the Supply Chain Management partners share real time data and information across the supply chain network which helps dual benefit to inventory and customer service. Another study by Minjire and Waiganjo (2015) revealed that one of

the factors that affect performance is poor communication and lack of joint planning and decision making.

Findings on collaborations with supply chain partners to create a more accurate forecast was also rated highly with a mean of 3.62 and a standard deviation of 0.92. This meant that firms in electricity energy sub-sector chain do collaborate for accurate forecasting of their client requirements. This finding is in harmony with the study of Reiner and Fichtinger (2009) that forecasting has an impact on fulfillment of the customer requirements, reducing risk and in measurement of Supply Chain process improvement.

However, the construct sharing of information with trade partners in electricity energy sub-sector supply chain was moderately rated with a mean of 3.35 and a standard deviation of 0.84. Majority of the respondents were neutral. This study finding agreed with the study by Fliedner (2014) who noted that fragmented information sharing is one of the key barriers to supply chain forecasting. Fliedner (2014) also revealed that early exchange of information between trading partners provides for longer term future views of demand in the supply chain and an enhanced ability to synchronize planning and execution. The value of sharing forecast information in electricity sub-sector can be shared from KPLC upstream to the primary fuel suppliers.

The study also sought the respondent's own perspective on how demand forecasting practice influence the performance of firms in electricity energy sub-sector. Findings are shown in Table 4.10

Table 4.10: Perceived Demand Forecasting Practice Influence on Firms in the Electricity Energy Sub-Sector in Kenya

Thematic Response	Frequency	Percent
Allows planning	87	65
Effective allocation of resources	31	23
Mitigate risks	16	12

From the findings shown in Table 4.10, majority of the respondents 65% perceived that demand forecasting assist the organization in planning, 23% perceived that it helps in allocation of resources and 12% felt that it helps mitigate possible risks. The findings are in agreement with Wang and Disney (2016) who in their study posited

that demand forecasting is recognized as an important capability for business planning and management. The findings also concur with Kilgar and Wagna (2015) who asserted that demand forecasting help organizations increase customer satisfaction, reduce inventory investments, improve distribution operations and anticipate future financial and capital requirements. Wamoto, Kwasira and Ndolo (2023) also asserts that joint forecasting reduces lead times. Moreover, effective demand forecasting enhances the organizations processes.

4.6.2 Correlational Analysis between Demand Forecasting Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (Lind, Marchal & Wathen, 2012). A correlation coefficient of between 0.0 and 0.19 is considered to be “very weak”, between 0.20 and 0.39 is considered to be “weak”, between 0.40 and 0.59 is considered to be “moderate”, between 0.60 and 0.79 is considered to be “strong” and between 0.80 and 1.0 is considered to be “very strong” (Lind et al 2017).

Correlation analysis was carried out between the variables of the study using Pearson product-moment correlation coefficient. Correlation Coefficient was used to test whether there existed interdependency between independent variables and also whether the independent variables were related to the dependent variable, performance of electricity energy sub-sector in Kenya.

Table 4.11: Correlation Analysis between Demand Forecasting Practice and Performance

		Demand Forecasting	Performance
Demand Forecasting	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	317	
Performance	Pearson Correlation	.390**	1
	Sig. (2-tailed)	.000	
	N	317	317

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

From the findings, there is a weak but positive relationship between Demand forecasting and performance of firms in electricity energy sub-sector in Kenya (r=0.390, p-value=0.000) as shown in Table 4.11.

4.6.3 Simple Linear Regression Findings of Demand Forecasting Practice

Simple regression was conducted to determine the influence of demand forecasting on performance of firms in electricity energy sub-sector in Kenya. The model used was $Y= ß_0+ ß_1X_1 + ε$.

H_{01}: Demand Forecasting has no significant influence on the performance of firms in electricity energy sub-sector in Kenya.

Linear Regression analysis was conducted so as to determine the influence of demand forecasting practice on the performance of firms in electricity energy sub-sector in Kenya. The linear regression model shows $R^2= 0.15$ which means that 15 percent change of performance of firms in electricity energy sub-sector in Kenya can be explained by a unit change of demand forecasting practice. The result is shown in Table 4.12.

Table 4.12: Model Summary of Demand Forecasting Practice and Performance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.390[a]	.152	.149	2.82189	1.512

Predictors: (Constant), Demand Forecasting
Dependent Variable: Performance

From the results there is an indication that one unit change in demand forecasting translates to 15 percent change in Performance of firms in electricity energy sub-sector in Kenya. Therefore, demand forecasting practice has influence on how firms in electricity energy sub-sector in Kenya perform. Similar findings were revealed by Seroney, Wanyoike and Langat (2019) who found that demand forecasting has a significant influence on supply chain management performance. Wamoto, Kwasira and Ndolo (2023) also established that demand forecasting influence operational performance of stores function in commercial state corporations.

4.6.4 ANOVA of Demand Forecasting Practice Findings

Further test on ANOVA showed that the significance of the F-statistic (56.449) is less than 0.05 since p value, p=0.00, as indicated in Table 4.13. This implies that there is a positive significant relationship between demand forecasting practice and performance of firms in electricity energy sub-sector in Kenya.

Table 4.13: ANOVA of Demand Forecasting Practice

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	449.512	1	449.512	56.449	.000[b]
	Residual	2508.369	315	7.963		
	Total	**2957.880**	**316**			

Dependent Variable: Performance

Further test on the beta coefficients of the resulting model showed, the constant β = 0.39, if the independent variable of demand forecasting practice is held constant then there will be a positive Performance of firms in electricity energy sub-sector in Kenya by 0.39. The regression coefficient for demand forecasting practice was positive and significant (β = 0.390) with a t-value=7.513 (p-value<0.001). As shown in Table 4.14.

Table 4.14: Coefficients of Demand Forecasting Practice

Model 1	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	7.953	.778		10.229	.000
Demand Forecasting	.401	.053	.390	7.513	.000

Dependent Variable: Performance

This implies that for every 1-unit increase in demand forecasting practice, Performance of firms in electricity energy sub-sector in Kenya is predicted to increase by 39% units and therefore H_1 was rejected which was demand Forecasting has no significant influence on the performance of firms in electricity energy sub-sector in Kenya and alternative hypothesis which was demand Forecasting has significant influence on the performance of firms in electricity energy sub-sector in Kenya was accepted. These findings revealed that demand forecasting practice contributed positively towards the performance of organizations. Demand forecasts form the basis of all supply chain planning (Gilliland, 2010). Forecasting has been consistently recognized as an important capability for business planning and management (Sanders & Manrodt, 2009).

Regardless of industry, or whether the company is a manufacturer, wholesaler, retailer, or service provider, effective demand forecasting helps organizations identify market opportunities, enhance channel relationships, increase customer satisfaction, reduce inventory investment, eliminate product obsolescence, improve distribution operations, schedule more efficient production and anticipate future financial and capital requirements Menzer & Moon, 2012). A realistic electricity energy sub-sector demand forecast is critical as it involves development of adequate supply of scarce resources that need to be used in the most optimal way. A high load forecast would lead to over-investment in expensive redundant capacities, while an insufficient demand forecast would result in capacity shortfalls that would slow down economic development and social progammes (GoK, 2016).

4.7 Influence of Strategic Sourcing Practice on performance of Firms in the Electricity Energy Sub-Sector in Kenya

The respondents were asked to indicate the sourcing strategies their organizations have been using in the past 5 years up to 2017 to acquire materials.

Table 4.15: Strategic Sourcing Strategies

Sourcing strategies	Frequency	Percent
Single sourcing	110	29
Multiple sourcing	210	56
Dual sourcing	55	15

From the findings shown in Table 4.15 majority of firms (56%) have been adopting multiple strategies for sourcing materials, 29 percent of respondents indicated that their firms have been using single sourcing strategies and 15 percent of respondents indicated that they have been using dual sourcing strategies in sourcing materials for their firms. These findings are in agreement with Bildsten (2015) who found out that different types of sourcing strategies have been developed and adopted by various companies while Gadde, *et al.* (2010) and Håkansson, *et al.* (2009) asserted that strategic decisions made with regard to sourcing have different types of economic consequences for the buying firm, the involved suppliers as well as other parties in the business network.

4.7.1 Strategic Sourcing Practice Descriptive Statistics Findings

The study sought respondents' opinion on influence of strategic sourcing on the performance of firms in electricity energy sub-sector in Kenya based on the following scale: 5 SA=strongly agree, 4 A=agree, 3 N= neutral, 2 D=disagree, 1 SD=strongly disagree. A standard deviation of more than one implied a significant difference in respondents. The results were as shown in Table 4.16. From the findings, majority of the respondents were in agreement with all the constructs on strategic sourcing.

Table 4.16: Strategic Sourcing Practice Descriptive Statistics Analysis

Opinion statement	Mean	Std. Deviation
The sourcing decisions ofone organization along the electricity energy sub-sector supply chain impact otherorganization's processes.	3.96	1.090
Buying a wrong item / service or buying from a wrong supplier can have a major impact on product and service offerings.	4.23	1.250
Strategic sourcing optimizes the organization's supply base.	4.34	1.102
Strategic sourcing incorporates the customers'needs such as on time delivery.	4.30	1.133
Sourcing is done basedon set guidelines.	4.07	0.919
Different approaches areused in negotiating with Suppliers.	4.23	0.964

Based on the study findings from Table 4.16, it was established that electricity energy sub-sector actors in Kenya use different approaches in negotiating with suppliers and was rated highly with a mean of 4.23 and a standard deviation of 0.964. This finding is in agreement with Bildsten (2015) who in his study found out that, different sourcing approaches have been developed such as single sourcing, multiple sourcing, dual sourcing, delegated sourcing, parallel sourcing, network sourcing and triadic sourcing which assist in making sourcing decision. It was also established that firm in electricity energy sub-sector use strategic sourcing to optimize their supply base and was rated highly with a mean of 4.34 and a standard deviation of 1.102. This finding was in agreement with Kihanya, Wafula and Munene (2015) who in their study "The role of strategic Sourcing on firms' performance" found out that supplier relationship is a critical sourcing factor that affects performance of an organisation. The finding is also in agreement with Pulles, *et al.* (2014) who posited that strategic sourcing is not only about selecting the 'best' suppliers based on some standards but it is also about the relationships with the suppliers.

It was also revealed that firms in electricity energy sub-sector in Kenya have incorporated customer needs in strategic sourcing such as on time delivery and was rated highly with a mean of 4.309 and a standard deviation of 1.133. This finding is in agreement with other studies such as Pulles, *et al.* (2014) who established that sourcing strategies is part of the overall purchasing and is related to defining the number of suppliers a firm will have for one specific component/product/service, given the

importance of the component and the structure of the supply market, and how the suppliers are related to each other which is an important factor to customer satisfaction.

Equally, the study established that buying a wrong item or service or buying from a wrong supplier can have a major impact on product and service offerings by firms in electricity energy sub-sector and was highly rated with a mean of 4.23 standard deviation of 1.25. This finding is in agreement with Duffie and Koester (2005) who found out that the consequences of wrong sourcing may range from late delivery to total service failure liability and can even affect market competitiveness. To avoid the risk of sourcing wrong items, Chepng'etich, Waiganjo, and Karani (2016) in their study on the influence of strategic sourcing on organizational performance of state corporation in Kenya recommended the need for the sourcing organization to partner with key suppliers of strategic items.

The study also found out that, firms in electricity energy sub-sector source their requirements based on set guidelines and was rated highly with a mean of 4.07 and a standard deviation of 0.919. This finding was in agreement with Boateng (2012) who asserted that organisations have moved away from traditional purchasing which was transactional and opportunistic in nature where organizations used to buy in response to immediate needs to futuristic sourcing and follows plans and strategies when sourcing.

Likewise, it was established that the sourcing decisions of one organisation in the electricity energy sub-sector impact other organization's processes and was rated highly with a mean of 3.968 and a standard deviation of 1.09. This was in agreement with Duffie and Koester (2005) who found out that in a global enterprise, one purchasing decision may impact numerous business processes or departments including manufacturing, receiving, distribution, marketing, sales or customer support. The finding was also in agreement with the study of Gadde, *et al.* (2010) and Håkansson, *et al.* (2009) who asserted that strategic decisions made with regard to sourcing have different types of economic consequences for the buying firm, the involved suppliers as well as other parties in the business network. Kihanya, Wafula,

Onditi, and Munene (2015) identified the quality of goods and services sourced as one of the critical sourcing factors that affect performance of an organization.

The study also asked the respondents own perspective on how strategic sourcing practice influence the performance of firms in electricity energy sub-sector. Findings are shown in Table 4.17.

Table 4.17: Perceived Strategic Sourcing Practice Influence on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Thematic Response	Frequency	Percent
Maximizes returns	89	35
Optimizes capacity utilization	78	31
Reduces costs	69	27
Improves quality of goods and services	15	06

From the findings shown in Table 4.20, 35% of the respondents felt that strategic sourcing helps in maximizing returns, 31% perceived that strategic sourcing optimizes capacity utilization, 27% felt that strategic sourcing reduces costs and 06% perceived that strategic sourcing improves the quality of goods and services. These findings concur with findings from a study by Mutua and Juma (2018) which revealed that, strategic sourcing enables competition and value for money leading to a lower unit cost. The findings also concur with the findings by Nyabuto (2016) who found out that, strategic sourcing has positive impact such as reduced costs and improvement in quality of goods and services in an organization.

4.7.2 Correlational Analysis between Strategic Sourcing Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (Lind, Marchal & Wathen, 2012). A correlation coefficient of between 0.0 and 0.19 is considered to be “very weak”, between 0.20 and 0.39 is considered to be “weak”, between 0.40 and 0.59 is considered

to be “moderate”, between 0.60 and 0.79 is considered to be “strong” and between 0.80 and 1.0 is considered to be “very strong” (Lind *et al.,* 2017).

The research carried out correlation analysis between the variables of the study using Pearson product-moment correlation coefficient. Correlation Coefficient was used to test whether there existed interdependency between independent variables and also whether the independent variables were related to the dependent variable, performance of firms in electricity energy sub-sector in Kenya.

Table 4.18: Correlation Analysis between Strategic Sourcing Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

		Strategic Sourcing	**Performance**
Strategic Sourcing	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	317	
Performance	Pearson Correlation	.361**	1
	Sig. (2-tailed)	.000	
	N	317	317

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

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

From the findings, there is a positive but weak association between strategic sourcing and performance of firms in electricity energy sub-sector in Kenya (r=0.361, p-value=0.000) as shown in Table 4.18.

4.7.3 Simple Linear Regression Findings of Strategic Sourcing Practice

Simple regression was conducted to determine the influence of strategic sourcing on performance of firms in electricity energy sub-sector in Kenya.

The model used was $Y= ß_0+ ß_2 X_2+ ε$

H_{02}: Strategic sourcing has no significant influence on the performance of firms in electricity energy sub-sector in Kenya.

To test the above hypothesis, linear regression was used to test the relationship between strategic sourcing and performance of firms in electricity energy sub-sector in Kenya. Path coefficients were used to determine the direction and strength while T statistics provided information on the significance to the relationships. The results are presented in Table 4.19.

Table 4.19: Model Summary of Strategic Sourcing Practice

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.36[a]	.130	.122	3.06230	1.927

a. Predictors: (Constant), Strategic sourcing
b. Dependent Variable: Performance

The R^2 for the regression model between strategic sourcing and performance of firms in electricity energy sub-sector in Kenya was 0.122 meaning that strategic sourcing explains 12.2 % variation in the performance of firms in electricity energy sub-sector in Kenya while the remaining variation is explained by the error term. The regression model was a good fit as indicated by a significant F statistic ($F=17.418$, $p<0.05$). The findings are presented in table 4.19.

4.7.4 ANOVA of Strategic Sourcing Practice

Table 4.20: ANOVA of Strategic Sourcing Practice

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	3.919	1	3.919	17.418	.000[b]
	Residual	2953.961	315	9.378		
	Total	2957.880	316			

a. Dependent Variable: Performance
b. Predictors: (Constant), Strategic sourcing
The regression model obtained from the output was

Performance =13.113 +0.381 strategic souring

The regression coefficient for strategic sourcing was 0.376. This indicated that a unit increase in the strategic sourcing would result in 37.6% increase in the performance of firms in electricity energy sub-sector in Kenya. The t-statistic for the regression coefficient for strategic sourcing was significant at 5% level of significance

(T=11.646, p<0.05) implying rejection of null hypothesis. The findings are presented in table 4.21. On the basis of these statistics, the study accepted the alternative hypothesis that there was significant positive relationship between strategic sourcing and performance of firms in electricity energy sub-sector in Kenya.

Table 4.21: Coefficients Strategic Sourcing Practice

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	13.113	.881		14.889	.000
	Strategic sourcing	.381	.0630	.376	11.646	.001

a. Dependent Variable: Performance

These findings are in harmony with studies reviewed in the literature that sourcing strategies is part of the overall purchasing strategy and it was found to increase performance of organizations (Bildsten, 2015). Therefore, strategic sourcing is related to defining the number of suppliers a firm will have for one specific component/product/service, given the importance of the component and the structure of the supply market, and how the suppliers are related to each other (Van Weele, 2001; Cousins, *et al.*, 2008). Different types of sourcing strategies have been developed (Bildsten, 2015). They include; single sourcing, multiple sourcing, dual sourcing, delegated sourcing, parallel sourcing, network sourcing and triadic sourcing (Dubois & Fredriksson, 2008).

4.8 Influence of Supply Chain Risk Management Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya.

The respondents were asked to indicate the unexpected outcome in their operations.

Table 4.22: Unexpected outcome in operations

Unexpected outcomes in operations	Frequency	Percent
Changes in time scheduled for activities	310	34
Changes in planned resources	214	23
Demand changes	361	39
Policy changes	33	4

The results as in Table 4.22 showed that 39 percent of respondents indicated that organizations have been experiencing demand changes during their operations, 34 percent indicated that their operations are affected by the changes in time scheduled for activities 23 percent of respondents indicated that their operations are affected by the resources plan alterations, and 4 percent indicated that operations are affected by policy changes.

4.8.1 Supply Chain Risk Management Practice Descriptive Statistics Findings

The study sought to establish the influence of supply chain risk management on the performance of firms in electricity energy sub-sector in Kenya. The respondents were asked to indicate the extent to which they agreed with supply chain risk practice opinion statements that are executed in their firms. This was on a scale of 5 SA=strongly agree, 4 A=agree, 3 N= neutral, 2 D=disagree and 1 SD=strongly disagree. A standard deviation of more than one implied a significant difference in respondents. The results of the analysis are presented in Table 4.23.

Table 4.23: Supply Chain Risk Management Practice Descriptive Statistics Analysis

Opinion statement	Mean	Std. Deviation
Organisations have different strategies such as alliances, use of e-procurement, integrating supply chains and collaborations to manage risks.	4.06	0.950
Supply chain risks cancause significant detrimental effects on supply chain such as disruptions in production andcancellation of clients' orders.	4.05	0.910
The organisation carries out assessment of risks regularly withinelectricity energysupply chain	3.996	1.140
The organisationsstakeholders areregularly trained on riskmanagement.	3.845	1.132
Organisations within electricity energy sub-sector share risk information with partners.	3.110	1.342

From the study findings, it was established that supply chain risk can cause significant detrimental effects on supply chain of firms in electricity energy sub-sector and was highly rated with a mean of 4.05 and a standard deviation of 0.910. This finding is in harmony with the study by Kihyun (2012) who found out that supply chains have

become more susceptible to unpredictable events that could lead to supply disruptions and undermine supply chain performance.

The study also found out that electricity energy sub-sector actors have different strategies such as alliances, use of e-procurement to integrate supply chains and collaborations to manage risks and was rated highly with a mean of 4.06 and a standard deviation of 0.950. This finding was in agreement with the findings of Kilubi and Haasis (2015) who established that in order to manage risk effectively, organisations are moving to adopt closer relationships with key players in the chain.

It was also established that, firms in electricity energy sub-sector carries out assessment of risks regularly within electricity energy sub-sector supply chain and was highly rated as agreed with a mean of 3.996 and SD of 1.140. This finding was in agreement with a study carried out by Kern, Moser, Hartmann and Moder (2012) who asserted that supply chain risk management entails identification and management of risks for the supply chain, through a coordinated approach amongst supply chain members, to reduce supply chain vulnerability as a whole. It was also found from the study that electricity energy sub-sector' stakeholders are regularly trained on risk management and was rated as a greed with a mean of 3.845 and a SD of 1.132. This result agreed with the study by Blackhurst *et al.* (2011); Rice and Caniato (2003) who noted that companies provide training to employees, suppliers and customers about security and supply network risks raising awareness and reinforcing the importance of supply chain resilience.

Sharing of risk information with partners within electricity energy sub-sector was however rated as neutral with a mean of 3.110 and a SD of 1.342. This finding concurred with a study by Adem (2014) which revealed that adoption of capacity reservation contracts and suppliers' disruption historical background checks had not been taken seriously by power sector firms in Kenya leading to supply chain disruptions. Ponomarov and Holcomb (2009) assert that "risk assessment and sharing among the members of a supply chain is an essential element of risk mitigation". Supply chain partners must share a common understandings and awareness of the risks that could occur within their operations (Faisal *et al.*, 2006).

The respondents were asked to give their own perspective on how supply chain risk management practice influence the performance of firms in electricity energy sub-sector. Findings are shown in Table 4.24.

Table 4.24: Perceived Supply Chain Risk Management Practice Influence on the Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Thematic Response	Frequency	Percent
Ensures reliability of services	14	58
Enable the organizations' face its challenges	09	38
Enable the organization achieve its goals	01	04

From the study findings shown in Table 4.24, it was established that 58% of the respondents felt that supply chain risk management ensure reliability of services, 38% perceived that supply chain risk management would enable the organization face its challenges and 4% perceived that supply chain risk management would enable the organization achieve its goals. These findings are in harmony with the findings by Victoria, Nyamwange and Harley (2017) who found out that supply chain risk management minimizes delays in the supply chain, reduces costs, enhances customer satisfaction through timely delivery, increases productivity and improves information flow.

4.8.2 Correlation Analysis between Supply Chain Risk Management Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense; a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (Lind, Marchal & Wathen, 2012). A correlation coefficient of between 0.0 and 0.19 is considered to be "very weak", between 0.20 and 0.39 is considered to be "weak", between 0.40 and 0.59 is considered to be "moderate", between 0.60 and 0.79 is considered to be "strong" and between 0.80 and 1.0 is considered to be "very strong" (Lind *et al* 2017).

Correlation analysis was carried out between the variables of the study using Pearson product-moment correlation coefficient. Correlation Coefficient was used to test whether there existed interdependency between independent variables and also whether the independent variables were related to the dependent variable, performance of firms in electricity energy sub-sector in Kenya.

Table 4.25: Correlation Analysis between Supply Chain Risk Management Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

		Supply chain risk management	Performance
Supply chain risk management	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	317	
Performance	Pearson Correlation	.431**	1
	Sig. (2-tailed)	.000	
	N	317	317

**. Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).

From the findings, there is a positive but weak association between supply chain risk management and performance of firms in electricity energy sub-sector in Kenya (r=0.431, p- value=0.000) as shown in Table 4.25.

4.8.3 Simple Linear Regression Findings of Supply Chain Risk Management Practice

Simple regression was conducted to establish the influence of supply chain management on performance of firms in electricity energy sub-sector in Kenya.

The model used was $Y= ß_0+ ß_3 X_3+ ε$

H_{03}: Supply chain risk management has no significant influence on the performance of firms in electricity energy sub-sector in Kenya.

To test the above hypothesis, simple linear regression was used to test the relationship between supply chain risk management and performance of firms in electricity energy

sub-sector in Kenya. Path coefficients were used to determine the direction and strength while T statistics provided information on the significance to the relationships. The results are presented in Table 4.26.

Table 4.26: Model Summary of Supply Chain Risk Management Practice

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.346[a]	.120	.107	3.03378	1.868

a. Predictors: (Constant), Supply chain risk management
b. Dependent Variable: Performance

The R^2 for the regression model between supply chain risk management and performance of firms in electricity energy sub-sector in Kenya was 0.107 meaning that supply chain risk management explains 10.7 % variation in the performance of firms in electricity energy sub-sector in Kenya while the remaining variation is explained by other factors not considered in this study. The regression model was a good fit as indicated by a significant F-statistic ($F=6.376$, $p<0.05$). The findings are presented in table 4.27.

4.8.4 ANOVA of Supply Chain Risk Management Practice

Table 4.27: ANOVA of Supply Chain Risk Management Practice

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	58.686	1	58.686	6.376	.012[b]
	Residual	2899.194	315	9.204		
	Total	2957.880	316			

a. Dependent Variable: Performance
b. Predictors: (Constant), Supply chain risk management

The regression model obtained from the output was

Performance =11.102 +0.227 supply chain risk management

The regression coefficient for supply chain risk management was 0.141. This indicated that a unit increase in the supply chain risk management would result in 14.1% increase in the performance of firms in electricity energy sub-sector in Kenya. The t-statistic for the regression coefficient for supply chain risk management was significant at 5% level of significance ($T=10.757$, $p<0.05$) implying rejection of null hypothesis. The

findings are presented in table 4.28. On the basis of these statistics, the study accepted alternative hypothesis that there is significant positive relationship between supply chain risk management and performance of firms in electricity energy sub-sector in Kenya.

Table 4.28: Coefficients of Supply Chain Risk Management Practice

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	11.102	1.032		10.757	.000
	Supply chain risk management	.227	.090	.141	2.525	.012

a. Dependent Variable: Performance

These study findings correspond with other studies reviewed in the literature that supply chain risk management can occur through contingency planning and by building more resilient and agile supply chains (Ngugi, 2013). It has been suggested by Ponomarov (2012) and Yang and Yang (2012) that any approach to managing risks in the supply chain should adopt cross company supply chain orientation as a way of increasing performance of organizations. For electricity energy sub-sector supply chain, it is crucial to manage risks that lead to delays in electricity energy sub-sector connection, high costs and disruption in power supply due to vandalism of equipment.

4.9 Influence of Contract Management Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

4.9.1 Contract Management Practice Descriptive Statistics Findings

The study sought to establish the influence of contract management on the performance of firms in electricity energy sub-sector in Kenya. The respondents were asked to indicate the extent to which they agreed with contract management practice opinion statements that are executed in their firms. This was on a scale of 5 SA=strongly agree, 4 A=agree, 3 N= neutral, 2 D=disagree and 1 SD=strongly disagree. A result of the analysis is presented in Table 4.29

Table 4.29: Contract Management Practice Descriptive Statistics Analysis

Opinion statements	Mean	Std. Deviation
Contract management team is inplace which helps in ensuring materials and services delivered meetthe required standards.	4.384	.998
Actors along in the sub-sector have efficient and secure sources for collecting and analyzing customers' complaints and providing the feedback.	3.659	.916
There are explicit standards and measures of performance betweendifferent stakeholders in electricity energy sub-sector sub sector	3.766	1.117
Contract management minimizesthe rate of power outages and losses.	4.047	1.122
Monitoring of the service provider's performance against theoutput specification is undertaken to ensure thefinancial implications ofany failure to perform has been taken into account.	4.04	0.893
Contract administration ensure that obligations and responsibilities definedunder the contract are met.	4.19	0.865

From the study findings, it was established that firms in electricity energy sub-sector have put in place contract management teams to help them in ensuring materials and services delivered meet the required standards and was highly rated with a mean of 4.384 and a standard deviation of 0.998. This finding concurs with findings by Oluka and Basheka (2013) who asserted that one of the components of contract management is setting up the contract management team which entails determining when the contract management team will be set up, the structure of the team, the attributes of the personnel involved and any initial and ongoing training needs. Further, results revealed that contract administration ensured that obligations and responsibilities defined under the contract are met and was rated with a mean of 4.19 and a standard deviation of 0.865. This result is in agreement with CIPS (2012), which posited that key elements of contract management include: contract communication; contract administration; managing performance; relationship management; and contract renewal or termination. The finding also concurs with the findings by Aluonzi, Oluka

and Nduhura (2016) who revealed that effective contract administration enhances the performance of a project.

The study also found out that majority of firms in electricity energy sub-sector monitor the service provider's performance against the output specification to ensure the financial implications of any failure to perform has been taken into account and was rated with a mean of 4.04 and a standard deviation of 0.893. This study is in agreement with the study by the Australian National Audit Office (ANAO) (2012), which found out that contract management involves pointing ongoing improvement in performance over the life of the contract, and the findings by EPEC (2014), which asserted that good contract management helps avoid additional costs and delays for client and difficulties for contractors or suppliers thus ensuring that both parties meet or exceed their obligations and that value for money is obtained for the organization.

Also, the study findings revealed that contract management of firms in electricity energy sub-sector minimizes the rate of power outages and losses and was rated at a mean of 4.47 and a standard deviation of 1.122. This finding agreed with Basingstoke and Deane (2013), who in their study found out that effective management and monitoring of contracts helps improve the quality of goods and services and reduces procurement cost thus achieving three broad goals of quality products and services, timely delivery of products and services, and cost effectiveness. The findings also revealed that firms dealing with electricity power have in place explicit standards and measures of performance between different stakeholders in electricity energy sub-sector sub sector and was moderately rated with a mean of 3.766 and a standard deviation of 1.117. This finding is in agreement with a study by Bhardwaj (2011), who posited that service payments by the buying organization to the vendor are matched to specific service delivery standards over time, subject to performance-based abatement where there is ongoing contract management. The study also found that actors in the electricity energy sub-sector moderately have efficient and secured sources for collecting and analyzing customer information and providing the feedback and was rated with a mean of 3.659 and a standard deviation of .916. Nguyen (2013) found out that inefficient management of contracts along the supply chain led to poor operational control, low customer satisfaction, high risks and unwanted costs. These study findings

are also in harmony with other studies reviewed in literature such CIPS (2012) which revealed that key elements of contract management include: contract communication; contract administration; managing performance; relationship management; and contract renewal or termination.

The respondents were also asked to indicate the quality problems mostly faced during the operations. From the findings, 56% of the respondents indicated the problem of quality of material and 44% indicated the problem of inadequate skills and capacity. The findings are presented in table 4.30.

Table 4.30: Quality Problem

Quality problem	Frequency	Percent
Inadequate skills and capacity	190	44
Quality of materials	240	56

This finding is in agreement with Basingstoke and Deane (2013) who asserted that effective management and monitoring of contracts helps improve the quality of goods and services and reduces procurement cost thus achieving three broad goals of quality products and services, timely delivery of products and services, and cost effectiveness. The findings also concur with the findings in a study by Rendon (2010), cited by Oluka and Basheka (2012) who observed that the critical success factors (CFS) of contract management is qualified workforce, clear processes, good relationships, adequate resources, supportive leadership, teamwork and defined policies.

4.9.2 Correlation Analysis between Contract Management Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

The correlation coefficient is a measure of linear association between two variables. Values of the correlation coefficient are always between -1 and +1. A correlation coefficient of +1 indicates that two variables are perfectly related in a positive linear sense, a correlation coefficient of -1 indicates that two variables are perfectly related in a negative linear sense, and a correlation coefficient of 0 indicates that there is no linear relationship between the two variables (Lind, Marchal & Wathen, 2012). A correlation coefficient of between 0.0 and 0.19 is considered to be “very weak”,

between 0.20 and 0.39 is considered to be "weak", between 0.40 and 0.59 is considered to be "moderate", between 0.60 and 0.79 is considered to be "strong" and between 0.80 and 1.0 is considered to be "very strong" (Lind *et al* 2017).

Correlation analysis was carried out between the variables of the study using Pearson product-moment correlation coefficient. Correlation Coefficient was used to test whether there existed interdependency between independent variables and also whether the independent variables were related to the dependent variable, performance of firms in electricity energy sub-sector in Kenya.

Table 4.31: Correlation Analysis between Contract Management Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

		Contract management	Performance
Contract management	Pearson Correlation	1	
	Sig. (2-tailed)		
	N	317	
Performance	Pearson Correlation	.280**	1
	Sig. (2-tailed)	.000	
	N	317	317

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed)

From the findings, there is a positive but weak association between contract management and performance of firms in electricity energy sub-sector (r=0.280, p-value=0.000) as shown in Table 4.31.

4.9.3 Simple Linear Regression Findings of Contract Management Practice

Simple regression was conducted to evaluate the influence of contract management on performance of electricity energy sub-sector in Kenya. The model used was $Y= ß_0+ ß_4 X_4+ ε$

H_{04}: Contract management has no significant influence on the performance of firms in electricity energy sub-sector in Kenya.

To test the above hypothesis, simple linear regression was used to test the relationship between contract management and performance of firms in electricity energy sub-sector in Kenya. Path coefficients were used to determine the direction and strength while T statistics provided information on the significance to the relationships. The results are presented in Table 4.32.

Table 4.32: Model Summary of Contract Management Practice

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.280[a]	.078	.075	2.94195	1.843

a. Predictors: (Constant), Contract Management
b. Dependent Variable: Performance

The R^2 for the regression model between contract management and performance of firms in electricity energy sub-sector in Kenya was 0.075 meaning that contract management explain 7.5 % variation in the performance of firms in electricity energy sub-sector in Kenya while the remaining variation is explained by other factors not considered in this study. The regression model was a good fit as indicated by a significant F statistic ($F=26.75$, $p<0.05$). The findings are presented in table 4.33.

4.9.4 ANOVA of Contract Management Practice

Table 4.33: ANOVA of Contract Management Practice

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	231.524	1	231.524	26.750	.000[b]
	Residual	2726.356	315	8.655		
	Total	2957.880	316			

a. Dependent Variable: Performance
b. Predictors: (Constant), Contract Management

The regression model obtained from the output was

Performance =9.202 +0.304 Contract management

The regression coefficient for contract management was 0.280. This indicated that a unit increase in the contract management would result in 28.0% increase in the performance of firms in electricity energy sub-sector in Kenya. The t-statistic for the

regression coefficient for contract management was significant at 5% level of significance (T=5.172, p<0.05) implying rejection of null hypothesis. The findings are presented in table 4.34. On the basis of these statistics, the study concludes that there is significant positive relationship between contract management and performance of firms in electricity energy sub-sector in Kenya. The finding concurs with the findings by Aluonzi, Oluka and Nduhura (2016) who revealed that effective contract administration enhances the performance of a project.

Table 4.34: Coefficients of Contract Management Practice

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	9.202	.880		10.459	.000
	Contract Management	.304	.059	.280	5.172	.000

Dependent Variable: Performance

4.10 Findings of Performance of Firms in the Electricity Energy Sub-Sector in Kenya.

The performance of firms in electricity energy sub-sector was measured in terms of financial and non-financial indicators which included revenue generation and customer satisfaction.

4.10.1 Revenue Indicator

The study sought to rate the performance of firms in electricity energy sub-sector in Kenya in terms of revenue generated and the customer satisfaction. Using the document analysis guide, financial reports for the year 2013 to 2017 were analysed. The results for the revenue generated during the referred to period are presented in Table 4.35

Table 4.35: Analysis of Financial Reports for the Year 2013-2017

Average revenue indicator of electricity energy sub-sector in Kenya	2013	2014	2015	2016	2017
Fuel costs (US$ millions)	43.547	53.642	58.175	65.667	72.663
Energy purchase/extraction costs (US$ millions)	44.301	53.849	57.660	65.733	72.293
Revenue from sales (US$ millions)	48.516	55.351	63.505	70.960	76.049
Profit before tax (US$ millions)	55.326	55.295	61.535	66.646	69.881

From the findings, the fuel costs had been increasing gradually form 43.55 percent in 2013 up to 72.66 percent in 2017. This was because the cost of fuel prices had been increasing globally. Also, extraction costs of energy had been on the rise from 44.3 percent in 2013 to 72.30 percent in 2017. This was due to the increase of costs of operations as the companies keeps expanding it growth and market size. Equally, the revenue sales had been increasing from 48.5 percent in 2013 to 76.05 percent in 2017. This was because the companies had increased the rate of power connectivity to the new customers and the companies had been generating more energy to national grid in order to satisfy the customers' needs. Also, the profitability of the companies had been increasing steadily from 55.3 percent to 69.9 percent in 2017. This was as result of the increase of sales revenue as shown in Table 4.35.

4.10.2 Customer Satisfaction Indicator

The customer survey sheets for the period under the study were not available for analysis.

4.10.3 Performance of Firms in Electricity Energy Sub-Sector Descriptive Statistics Analysis

The respondents were also asked to indicate the extent to which they agreed with performance opinion statements in relation to customer satisfaction with the operations that are executed in their organizations. This was on a scale of 5 SA=strongly agree, 4 A=agree, 3 N= neutral, 2 D=disagree and 1 SD=strongly disagree.

Table 4.36: Performance of Firms in the Electricity Energy Sub-Sector Descriptive Statistics Analysis

Opinion statement	Mean	Std. Deviation
Ordered supplies are deliveredon time.	3.466	1.007
Anticipated delays are communicated on time.	3.615	.926
Grievances aresorted out within the shortest time possible.	3.504	1.181
Feedback from customers is analyzed and responded to appropriately.	3.425	1.274

From the findings in Table 4.36, majority of the respondents agreed that anticipated delays are communicated on time and was highly rated with a mean of 3.615 and a standard deviation of 0.926. However, a moderate number of the respondents agreed that ordered supplies are delivered on time and was moderately rated with a mean of 3.466 and a standard deviation of1.007, grievances are sorted within the shortest time possible was also moderately rated with a mean of 3.504 and a standard deviation of 1.181. The respondent had a wide varied opinion on the statement that feedback from customers is analyzed and responded to appropriately and was moderately rated with a mean of 3.425 and a standard deviation of 1.274. A standard deviation of more than one implies a significant difference in respondents.

The respondents were asked to state the probable constraints that they perceive affect the performance of firms in electricity energy sub-sector in Kenya.

Table 4.37: Constraint that affect the Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Thematic Responses	Frequency	Percent
Ethical issues	112	24
Leadership	97	21
Political interference	80	17
Quality of materials	77	16
Resources	53	11
Climate Change	33	7
Infrastructure	15	3

From the findings as indicated in Table 4.37, several constraints were revealed which included; ethical issues 24%, leadership 21%, political interference 17%, quality of materials 16%, resources 11% climate change 7% and infrastructure 3 %. The results are in agreement with the report by AfDB (2021), on country priority plan and diagnostic of the Electricity Sector Kenya, which revealed that high cost of power and

losses are due to functionaries taking payments to reduce customer bills, lack of insight of issues on the grid, poor equipment, incomplete infrastructure, inability to align necessary incentives and regulations at the regional level and vandalism of equipment among others.

The respondents were also asked to provide probable solution/s to the constraint/s and the responses are as indicated in Table 4.38.

Table 4.38: Solution/s to Constraint/s that affect the Performance of Firms in the Electricity Sub-Sector in Kenya

Thematic Responses	Frequency	Percent
Adhere to ethical code and regulations	186	40
Industrial leadership	110	23
Have diverse sources of power	66	14
Be independent of political issues	53	11
Source quality products	36	8
Put in place risk mitigation measures	18	4

From the findings as indicated in Table 4.38, several solutions were availed which included; adherence to ethical codes and regulations 40%, have industrial leaders 23%, have diverse sources of power 14%, be independent of political issues 11%, source quality products 8% and put in place risk mitigation measures 4%. The results are in agreement with the findings of a study done by Kimemia and Morange (2018), which revealed that adoption of collaborative procurement practices in Kenya Electricity Transmission Company Limited can be achieved by having strategic leaders within the sector. Langat and Nyang'au (2020), recommended industrial leadership in geothermal power projects while Mutembete and Yusuf (2020), found the need to venture in to risk control systems to ensure project success.

4.10.4 Multiple Regression Model Findings

The regression analysis shows a weak relationship, R^2=0.180 which shows that 18.0 percent change in performance of electricity energy sub-sector in Kenya can be explained by a change of one unit of all the predictor variables jointly as shown on Table 4.39.

Table 4.39: Model Summary of Overall Regression Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.436[a]	.190	.180	2.77049	1.522

a. Predictors: (Constant), Supply chain risk management, Strategic sourcing, Contract Management, Demand Forecasting
b. Dependent Variable: Performance

Further test on ANOVA shows that the significance of the F-statistic (18.340) is less than 0.05 since p value, p=0.00, as indicated in Table 4.40.

Table 4.40: ANOVA of Overall Regression Model

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	563.083	4	140.771	18.340	.000[b]
	Residual	2394.797	312	7.676		
	Total	2957.880	316			

a. Dependent Variable: Performance
b. Predictors: (Constant), Supply chain risk management, Strategic sourcing, Contract Management, Demand Forecasting

This implied that there was a positive significant relationship between independent variables and performance of firms in electricity energy sub-sector in Kenya. Thus, supply chain risk management, strategic sourcing, contract management, demand forecasting enhances performance ofelectricity energy sub-sector in Kenya.

The following model was used to determine the overall regression coefficient

$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$

Y= Performance of firms in electricity energy sub-sector in Kenya

β_0=constant

X_1=Demand forecasting practice

X_2=Strategic sourcing practice

X_3=Supply chain risk management practice

X_4 =Contract management practice

β_i is the coefficient for X_i (i=1, 2,3,4)

ε =error term

All variables are significantly different from 0, with p values 0.000, and are less than p=0.05 as summarized in Table 4.41. Model 1 reveals the details of the inclusion of the model. Demand forecasting was found to be significant (p< 0.05, B =.196), Strategic sourcing was found to be significant (p<0.05, B =.415), supply chain risk management was found to be significant (p<0.05, B =.018), and contract management was found to be significant (p<0.05, B =.190).

The regression model obtained from the model without the moderator was:

Performance = 2.289 + 0.196Demand Forecasting + 0.415Strategic Sourcing + 0.018Supply Chain Risk Management + 0.190Contract Management

Table 4.41: Coefficients of Overall Regression Model

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.289	1.304		5.592	.000
	Contract Management	.196	.058	.181	3.362	.001
	Demand Forecasting	.415	.065	.403	6.331	.000
	Strategic sourcing	.018	.055	.017	.325	.002
	Supply chain risk management	.190	.099	.118	1.918	.001

a. Dependent Variable: Performance

4.11 Moderating effect of Procurement Regulations Compliance on the Relationship between Supply Chain Management Practices and Performance of Firms in Electricity Energy Sub-Sector in Kenya

The study sought to establish the moderating effect of procurement regulations on the performance of firms in electricity energy sub-sector subsector in Kenya. The

respondents were asked to indicate the extent to which they agreed with opinion statements on procurement regulations effect on performance of firms in electricity energy sub-sector subsector in Kenya. This was on a scale of 5 SA=strongly agree, 4 A=agree, 3 N= Neutral, 2 D=disagree and 1 SD=strongly disagree. The result of the analysis is presented in Table 4.42.

Table 4.42: Procurement Regulations Compliance Descriptive Statistics Analysis

Opinion statement	Mean	Std. Deviation
Procurement regulations compliance ensure accountability in demand forecasting	3.741	1.31543
Procurement regulations compliance enhance transparency in sourcing	3.927	1.10427
Procurement regulations compliance ensure transparency in managing contracts	3.893	1.11712
Procurement regulations compliance ensure accountability in management of risks in the firm	4.082	1.10217

From the findings in Table 4.42, majority of the respondents agreed that regulations compliance ensure accountability in management of risks in the firm and was rated highly with a mean of 4.082 and standard deviation of 1.10. Similarly, majority of the respondents agreed that procurement regulations compliance enhance transparency in sourcing and Procurement regulations compliance ensure transparency in managing contracts. This was highly rated with a mean of 3.92 and 3.89 respectively and a standard deviation of 1.104 and 1.117 respectively. These findings concurred with the results in a study by Mutai and Chirchir (2015) who found out that, compliance with procurement regulations enables organisations achieve transparency, efficiency and accountability. However, a moderate number of the respondents agreed that procurement regulations compliance ensure accountability in demand forecasting with a mean of 3.74 and a standard deviation of 1.315.

Further, regression analysis was conducted to establish the moderating effect of procurement regulations on each study variables, followed by overall results on moderating variable as discussed below.

The research hypothesis formulated from the specific research objective was:

H_{05}: Procurement regulations compliance has no significant moderating effect on the performance of firms in electricity energy sub-sector in Kenya.

4.11.1 Moderating effect of Procurement Regulations Compliance on Demand Forecasting Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

The study was carried out to establish the moderating effect of procurement regulations compliance and demand forecasting on performance of firms in electricity energy sub-sector in Kenya. The results are presented in Table 4.43

Table 4.43 Moderating effect of Procurement Regulations Compliance on Demand Forecasting Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.423[a]	.179	.173	1.28545
2	.436[b]	.190	.184	1.37536

a. Predictors: (Constant), demand forecasting
b. Predictors: (Constant), procurement regulations compliance*demand forecasting
c. Dependent Variable: performance

It was noted The R^2 for model one was 0.173 implying that demand forecasting and procurement regulations compliance jointly explain 17.3% variation in performance of firms in electricity energy sub-sector in Kenya as indicated in Table 4.43. This implied that the interaction between demand forecasting and procurement regulations compliance cause significant changes in performance of firms in electricity energy sub-sector in Kenya compared to the effect of demand forecasting on performance of firms in electricity energy sub-sector alone. This means that jointly, interaction of demand forecasting and procurement regulations cause changes in performance of firms in electricity energy sub-sector in Kenya. Thus electricity energy sub-sector

should put in to consideration existing procurement regulations when carrying out demand forecasts to enhance their performance.

Additional analysis on ANOVA showed that, the regression model was a good fit as indicated by the significant F-statistic (Fvalue =154.137, $p<0.05$). When introducing the moderating variable as shown in model 2, the model is still significant (Fvalue=111.835, $p<0.05$) concluding that procurement regulations compliance significantly moderates the relationship between demand forecasting practice and performance of firms in electricity energy sub-sector in Kenya as shown in Table 4.44.

Table 4.44 ANOVA[a] Moderating results of Procurement Regulations Compliance on Demand Forecasting Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	45.603	2	22.802	154.137	.000[b]
	Residual	23.425	314	.0746		
	Total	69.028	316			
2	Regression	47.848	3	15.949	111.835	.000[c]
	Residual	21.880	313	.070		
	Total	69.728	316			

a. Dependent Variable: performance

b. Predictors: (Constant), demand forecasting
c. Predictors: (Constant), procurement regulations compliance*demand forecasting

4.11.2 Moderating effect of Procurement Regulations Compliance and Strategic Sourcing Practice

The study sought to establish the moderating effect of procurement regulations compliance and strategic sourcing on performance of firms in electricity energy sub-sector in Kenya. The results are presented in Table 4.45

Table 4.45 Model Summary of Moderating effect of Procurement Regulations Compliance on Strategic Sourcing Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.563[a]	.317	.311	1.36653
2	.589[b]	.347	.341	1.36196

a. Predictors: (Constant), strategic sourcing
b. Predictors: (Constant), procurement regulations compliance*strategic sourcing
c. Dependent Variable: performance

The study sought to establish the moderating effect of procurement regulations compliance and strategic sourcing on performance of firms in electricity energy sub-sector in Kenya. It was noted that the R^2 for model one was 0.311 implying that strategic sourcing and procurement regulations jointly explain 31.1% variation in performance of firms in electricity energy sub-sector in Kenya as indicated in Table 4.48. This implied that the interaction between strategic sourcing and procurement regulations cause significant changes in performance of firms in electricity energy sub-sector in Kenya compared to the effect of strategic sourcing on the performance of firms in electricity energy sub-sector alone. Thus electricity energy sub-sector should comply with the existing procurement regulations when sourcing to enhance performance. This finding agree with the study by Kisang and Kihara (2017) who found out that sourcing regulations positively influence the performance of public sector in Kenya.

Further analysis on ANOVA established that, the regression model was a good fit as showed by the significant F-statistic (Fvalue =178.529, $p<0.05$). When introducing the moderating variable as shown in model 2, the model was still significant (Fvalue=124.102, $p<0.05$) concluding that procurement regulations compliance significantly moderates the relationship between strategic sourcing practices and performance of firms in electricity energy sub-sector in Kenya as shown in Table 4.46.

Table 4.46 ANOVA[a] Moderating results of Procurement Regulations Compliance and Strategic Sourcing Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	47.735	2	23.868	178.529	.000[b]
	Residual	21.103	314	.068		
	Total	68.838	316			
2	Regression	48.398	3	16.1133	124.102	.000[c]
	Residual	20.440	313	.065		
	Total	68.828	316			

a. Dependent Variable: performance
b. Predictors: (Constant), strategic sourcing
c. Predictors: (Constant), procurement regulations*strategic sourcing

4.11.3 Moderating effect of Procurement Regulations Compliance and Supply Chain Risk Management Practice

The study sought to determine the moderating effect of procurement regulations compliance and supply chain risk management on performance of firms in electricity energy sub-sector in Kenya. The results are presented in Table 4.47

Table 4.47 Moderating effect of Procurement Regulations Compliance on Supply Chain Risk Management Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.573[a]	.328	.322	.41996
2	.583[b]	.340	.334	.41294

a. Predictors: (Constant), supply chain risk management
b. Predictors: (Constant), supply chain risk management*procurement regulations compliance
c. Dependent Variable: performance

The regression analysis established that, the R^2 for model one was 0.322 implying that supply chain risk management and procurement regulations jointly explain 32.2% variation on performance of firms in electricity energy sub-sector in Kenya as indicated in Table 4.50. This implies that the interaction between supply chain risk management and procurement regulations cause significant changes on performance of firms in electricity energy sub-sector in Kenya compared to the effect of supply chain risk management on performance of firms in electricity energy sub-sector in Kenya alone. Thus electricity energy sub-sector in Kenya should consider the existing procurement regulations when managing supply chain risk to enhance their performance.

Additional analysis on ANOVA was carried out, the regression model was a good fit as showed by the significant F-statistic (Fvalue =115.628, $p<0.05$). When introducing the moderating variable as shown in model 2, the model was still significant (Fvalue=81.546, $p<0.05$) concluding that procurement regulations compliance significantly moderates the relationship between supply chain risk management

practice and performance of firms in electricity energy sub-sector in Kenya as shown in Table 4.48

Table 4.48 ANOVA[a] Moderating results of Supply Chain Risk Management Practice and Procurement Regulations Compliance

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.138	2	21.069	115.628	.000[b]
	Residual	28.690	314	.091		
	Total	70.828	316			
2	Regression	52.227	3	17.409	81.546	.000[c]
	Residual	27.601	314	.088		
	Total	79.828	316			

a. Dependent Variable: performance
b. Predictors: (Constant), supply chain risk management
c. Predictors: (Constant), supply chain risk management*procurement regulations compliance

4.11.3 Moderating effect of Procurement Regulations Compliance and Contract Management Practice

The study sought to determine the moderating effect of procurement regulations compliance and contract management on performance of firms in electricity energy sub-sector in Kenya. The results are presented in Table 4.49

Table 4.49 Moderating effect of Contract Management Practice and Procurement Regulations Compliance

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.587[a]	.345	.339	1.42532
2	.612[b]	.375	.369	1.40405

a. Predictors: (Constant), contract management
b. Predictors: (Constant), contract management*procurement regulations compliance
c. Dependent Variable: performance

The regression analysis established that the R^2 for model one was 0.339 implying that contract management and procurement regulations jointly explain 33.9% variation in performance of firms in electricity energy sub-sector in Kenya as indicated in Table 4.49. This implied that the interaction between contract management and procurement regulations cause significant changes on performance of firms in electricity energy

sub-sector in Kenya compared to the effect of contract management on performance of firms in electricity energy sub-sector in Kenya alone. This means that jointly interaction of contract management and procurement regulations higly cause changes on performance of firms in electricity energy sub-sector in Kenya. Thus electricity energy sub-sector should comply with existing procurement regulations when managing contracts to enhance their performance.

Additional analysis on ANOVA was carried out. The regression model was a good fit as showed by the significant F-statistic (Fvalue =110.745, $p<0.05$). When introducing the moderating variable as shown in model 2, the model was still significant (Fvalue=87.533, $p<0.05$) concluding that procurement regulations significantly moderates the relationship between contract management practice and performance of firms in electricity energy sub-sector as shown in Table 4.50

Table 4.50 ANOVA[a] Moderating effect of Procurement Regulations Compliance on Contract Management Practice and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	41.428	2	20.714	110.745	.000[b]
	Residual	27.400	314	.087		
	Total	68.828	316			
2	Regression	42.360	3	14.120	87.533	.000[c]
	Residual	24.468	313	.078		
	Total	66.628	316			

a. Dependent Variable: performance

b. Predictors: (Constant), contract management

c. Predictors: (Constant), contract management*procurement regulations compliance

4.11.5 Overall Moderating effect of Procurement Regulations Compliance and Supply Chain Management Practices

The study sought to determine the overall moderating effect of procurement regulations compliance on all the variables of the study. The results are presented in Table 4.51

Table 4.51: Model Summary of Overall Moderating effect of Procurement Regulations Compliance on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.497[a]	.247	.231	.644
2	.632[b]	.399	.377	.580

a. Predictors: (Constant), Supply chain risk management, Strategic Sourcing, Contract Management, Demand Forecasting

b. Predictors: (Constant), Supplychain risk management*Procurement Regulations Compliance, Strategic sourcing*Procurement Regulations Compliance, Contract Management*Procurement Regulations Compliance, Demand Forecasting*Procurement Regulations Compliance

The R^2 for model one was 0.231 implying that procurement regulations compliance, supply chain risk management, strategic sourcing, contract management and demand forecasting jointly explains 23.1% variation in performance of firms in electricity energy sub-sector in Kenya.

The results indicate that the inclusion of the interaction term resulted into an R^2 change of .377, showing presence of significant moderating effect. This implies that the moderating effect of procurement regulations compliance gained 37.7% variance in the performance of firms in electricity energy sub-sector in Kenya, above and beyond the variance by supply chain management practices the findings are presented in table 4.51. Thus, the study rejects the null hypothesis. These findings are in harmony with the study of Mutai and Chirchir (2015) who found that purchasing regulations and procedures enable organizations achieve transparency efficiency and accountability in their operations.

Further test on ANOVA was done and the findings were presented in table 4.52.

Table 4.52: ANOVA of Overall Moderating effect of Procurement Regulations Compliance on Supply Chain Management Practices and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	32.564	5	6.513	15.682	.000[b]
	Residual	99.256	311	.319		
	Total	131.820	316			
2	Regression	52.673	9	5.853	17.377	.000[c]
	Residual	79.148	307	.258		
	Total	131.820	316			

a. Dependent Variable: Performance

b. Predictors: (Constant), Supply chain risk management, Strategic sourcing, Contract Management, Demand Forecasting

Predictors: (Constant), Supply chain risk management*Procurement Regulations Compliance, Strategic sourcing*Procurement Regulations Compliance, Contract Management*Procurement Regulations Compliance, Demand Forecasting*Procurement Regulations Compliance

Regression model one was a good fit as indicated by the significant F-statistic (F value =15.682, $p<0.05$). Upon introduction of the interaction term presented as model 2, the model is still significant (F value=17.377, $p<0.05$) the findings are presented in table 4.53 inferring that Procurement regulations compliance significantly moderate the relationship between supply chain management practices and performance of firms in electricity energy sub-sector in Kenya.

Table 4.53: Coefficients of Overall Moderating effect of Procurement Regulations Compliance on Supply Chain Management Practices and Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	T	Sig.
1	(Constant)	2.289	1.304		5.592	.000
	Demand forecasting	.196	.058	.181	3.362	.001
	Strategic sourcing	.415	.065	.403	6.331	.000
	Supply chain risk management	.018	.055	.017	.325	.002
	Contract management	.190	.099	.118	1.918	.001
2	(Constant)	.996	.434		2.297	.023
	Demand Forecasting*procurement regulations compliance	.068	.074	.064	.922	.018
	Strategic sourcing*procurement regulations compliance	.171	.057	.204	3.013	.003
	Supply chain risk management*procurement regulations compliance	.185	.072	.204	2.563	.011
	Contract Management*procurement regulations compliance	.267	.044	.338	6.032	.000

a. Dependent Variable: Performance

Model 1 reveals the details of the inclusion of the model. Demand forecasting was found to be significant ($p< 0.05$, B =.196), Strategic sourcing was found to be significant ($p<0.05$, B =.415), supply chain risk management was found to be significant ($p<0.05$, B =.018), and contract management was found to be significant ($p<0.05$, B =.190).

The regression model obtained from the model without the moderator was:

Performance = 2.289 + 0.196Demand Forecasting + 0.415Strategic Sourcing + 0.018Supply Chain Risk Management + 0.190Contract Management

Model 2 reveals the details of the inclusion of the interactive term in the model. Demand forecasting*procurement regulations compliance was found to be significant ($p< 0.05$, B =.068), Strategic sourcing*procurement regulations compliance was found

to be significant ($p<0.05$, B =.171), supply chain risk management*procurement regulations compliance was found to be significant ($p<0.05$, B =.185), and contract management*procurement regulations compliance was found to be significant ($p<0.05$, B =.267).

The regression model obtained from the moderated effect of procurement regulations compliance was:

Performance = 0.996 + 0.068 Demand Forecasting*procurement regulations compliance + 0.171 Strategic Sourcing*procurement regulations compliance + 0.185 Supply chain risk management*procurement regulations compliance + 0.267 Contract management*procurement regulations compliance

4.12 Hypotheses Testing Findings

The findings on testing of hypotheses are as shown in table 4.54:

Table 4.54: Hypotheses Testing Findings

S. No.	Hypotheses	Decision Rule	T - Test & P – Value	Decision
1	**H_{01}:** Demand Forecasting has no significant influence on the performance of firms in electricity energy sub-sector in Kenya. **H_{a1}:** Demand Forecasting has a positive influence on the performance of firms in electricity energy sub-sector in Kenya.	If $P \leq 0.05$, reject Ho_1 and accept Ha_1	3.362 & .001	Reject Ho_1 **Accept H_{a1}**
2	**H_{02}:** Strategic Sourcing has no significant influence on the performance of firms in electricity energy sub-sector in Kenya. **H_{a2}:** Strategic Sourcing has a positive significant influence on the performance of firms in electricity energy sub-sector in Kenya.	If $P \leq 0.05$, reject Ho_2 and accept Ha_2	6.331 & .000	Reject Ho_2 **Accept H_{a2}**
3	**H_{03}:** Supply Chain Risk Management has no significant influence on the performance of firms in electricity energy sub-sector in Kenya. **H_{a3}:** Supply Chain Risk Management has a positive significant influence on the performance of firms in electricity energy sub-sector in Kenya.	If $P \leq 0.05$, reject Ho_3 and accept Ha_3	.325 & .002	Reject Ho_3 **Accept H_{a3}**
4	**H_{04}:** Contract Management has no significant influence on the performance of firms in electricity energy sub-sector in Kenya. **H_{a4}:** Contract Management has a positive significant influence on the performance of firms in electricity energy sub-sector in Kenya.	If $P \leq 0.05$, reject Ho_4 and accept Ha_4	1.918 & .001	Reject Ho_4 **Accept H_{a4}**
5	**H_{05}:** Procurement Regulations Compliance has no significant moderating effect on the relationship between supply chain management practices and performance of firms in electricity energy sub-sector in Kenya. **H_{a5}:** Procurement Regulations Compliance has a positive significant moderating effect on the relationship between supply chain management practices and performance of firms in electricity energy sub-sector in Kenya.	If $P \leq 0.05$ for all independent variables with the inclusion of the moderator, reject Ho_{5s} and accept Ha_{5s}	.922 3.013 2.563 6.032 & .018 .003 .011 .000	Reject Ho_{5s} **Accept H_{a5s}**

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter provides a summary of the major findings of this study and also sets to draw conclusions and make recommendations for supply chain management practices and suggestions for further research based on the results of this study.

5.2 Summary

5.2.1 Influence of Demand Forecasting Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Forecasting is a prediction or an estimation of an actual value in a future time period. From the existing literature, effective demand forecasting helps organizations identify market opportunities, enhance channel relationships, increase customer satisfaction, reduce inventory investment, eliminate product obsolescence, improve distribution operations, schedule more efficient production and anticipate future financial and capital requirements. Demand Forecasting also plays an important domain inside as well as outside the company by driving key factors in planning and making decisions in SCM as well as at the enterprise level.

Based on the study findings, it was established that firms in electricity energy sub-sector in Kenya scan the operating environment in order to conduct accurate forecasts since macro environmental factors have an impact on forecasting. Further, it was noted that consumption rate data is shared throughout firms in electricity energy sub-sector and organizations communication systems are closely integrated for effective sharing of forecast information. The study also established that players in electricity energy sub-sector recognizes the need for collaborations with supply chain partners to create a more accurate forecast of their client's requirements. It was also established that demand forecasting assists an organization in planning and resource allocation.

However, it was established that majority of electricity energy sub-sector firms in Kenya do not share information with trade partners.

Additionally, the study established that demand forecasting practice showed a weak but positive correlation with the performance of firms in electricity energy sub-sector in Kenya. Further results on regression indicated that demand forecasting reveals variation in the performance of firms in electricity energy sub-sector in Kenya and the regression model was a good fit. Also, the standardized regression coefficient for demand forecasting indicated that a unit increase in the demand forecasting would result in thirty-nine percent increase in the performance of firms in electricity energy sub-sector in Kenya. Thus, demand forecasting was significant and the null hypothesis (H_{01}) was rejected. Therefore, demand forecasting has a significant influence on the performance of firms in electricity energy sub-sector in Kenya.

5.2.2 Influence of Strategic Sourcing Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Strategic sourcing is a systematic and fact-based approach for optimizing an organization's supply base and improving the overall value proposition. From the existing literature, it was established that the main objective of strategic sourcing was to reduce the cost while maintaining or improving the quality of a product or service, examine supplier relationships across the entire organization and leverage entire organizations spend. But strategic sourcing is not easy affair as it becomes more complex as the amount of unique raw materials, ingredients, parts, components, connectors, apparatus, products, equipment, supplies, and services increase and the number of actors involved in the decisions expand. In a global enterprise, one purchasing decision may impact numerous business processes or departments including manufacturing, receiving, distribution, marketing, sales or customer support. Therefore, many companies have realized the need for elevating traditional procurement function to modern strategic sourcing for value addition across the supply chain, since the risks of buying the wrong items, services or buying from the wrong supplier can have major impacts and ripple effect throughout a business.

From the study it was found out that majority of firms in electricity energy sub-sector have adopted multiple sourcing strategy to acquire materials. It was also, established that firms in electricity energy sub-sector in Kenya use different approaches in negotiation with suppliers. Further, it was established that strategic sourcing optimizes the firms supply base. Equally, the study revealed that firms in electricity energy sub-sector in Kenya has incorporated customer needs in strategic sourcing such as on time delivery. In addition, the study established that buying a wrong item or service or buying from a wrong supplier can have a major impact on product or service offerings by the firms and thus the adoption of sourcing decisions based on set guidelines by the organizations. Further, it was noted that the sourcing decisions of one organization along the electricity energy sub-sector supply chain can also impact other organization's processes and thus the need for collaboration in decision making. The study also revealed that strategic sourcing helps in maximizing returns, optimizes capacity utilization and reduces costs.

Lastly, the study found out that strategic sourcing practice showed a weak but positive correlation with performance of firms in electricity energy sub-sector in Kenya. Additional results on regression indicated that strategic sourcing revealed a variation in the performance of firms in electricity energy sub-sector in Kenya and the regression model was a good fit. Also, the standardized regression coefficient for strategic sourcing indicated that a unit increase in the strategic sourcing would result in thirty-seven percent increase in the performance of firms in electricity energy sub-sector in Kenya. Thus, strategic sourcing was significant and the null hypothesis (H_{02}) was rejected. Therefore, strategic sourcing has a significant influence on the performance of firms in electricity energy sub-sector in Kenya.

5.2.3 Influence of Supply Chain Risk Management Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Supply chain risk is the potential occurrence of an inbound supply incident which leads to the inability to meet customer demand. Supply chain risks comprise any risks for the information, material and product flows from original supplier to the delivery of the final product for the end user. Risk management is a continual process that involves

long-term dedication of supply chain members. According to reviewed literature, in order to manage risk effectively, organizations are moving to adopt closer relationships with key players in the chain. Some of the strategies reviewed in literature used by organizations to expand their power and manage the risk of uncertainty include; mergers and alliances; the use of e-procurement to integrate supply chains leading to reduced transaction costs and collaborative supply management which increase product reliability and reduces risks in product production.

Based on the study findings, it was established that organizations operational activities have been hampered by a number of activities such as demand changes, plans alterations, changes in time scheduled for activities and sometimes operations are affected by policy changes. Also, it was noted that in electricity energy sub-sector, supply chain risks can cause detrimental effects on supply chain production and cancellation of clients' orders. The study also established that organizations have adopted different strategies such as alliances, e-procurement, integrating supply chains and collaborations to manage risks. Likewise, the study found out that assessment of risks is carried out regularly within firms in electricity energy sub-sector. The study also found out that electricity energy sub-sector' stakeholders are regularly trained on risk management issues. The study also revealed that supply chain risk management ensures reliability of services. However, the study revealed that regular sharing of supply chain risk information with partners in electricity energy sub-sector was not seriously taken.

Further, the study established that supply chain risk management practice showed a weak positive correlation with performance of firms in electricity energy sub-sector in Kenya. Additional results on regression indicated that supply chain risk management exhibited variation in the performance of firms in electricity energy sub-sector in Kenya and the regression model was a good fit. Also, the standardized regression coefficient for supply chain risk management indicated that a unit increase in the supply chain risk management would result in fourteen percent increase in the performance of firms in electricity energy sub-sector in Kenya. Thus, supply chain risk management was significant and the null hypothesis (H_{03}) was rejected. Therefore,

supply chain risk management has a significant influence on the performance of firms in electricity energy sub-sector in Kenya.

5.2.4 Influence of Contract Management Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Contract management from reviewed literature, is the process of managing contracts entered in to with vendors, partners, customers, or employees. Contract management includes negotiating the terms and conditions of contracts and ensuring compliance with the terms and conditions, documenting and agreeing on any changes that may arise during its implementation or execution. Some key elements of contract management noted in the reviewed literature include: contract communication; contract administration; managing performance; relationship management; and contract renewal or termination. Also, it was observed from the literature that for contract management to succeed there must be qualified workforce, clear processes, good relationships, adequate resources, supportive leadership, teamwork and defined policies all of which have direct impact on contractors' performance. The aims of contract management in SCM are to ensure: Services are delivered continuously and to a high standard in accordance with the contract and payments or penalties are made accordingly. However, from the literature reviewed it was established that electricity power sector in Kenya, has weak contract management practice.

From the study findings, it was revealed that firms in electricity energy sub- sector have put in place contract management teams to help them in ensuring materials and services delivered meet the required standards. Equally, the study noted that contract administration in electricity energy sub-sector firms ensures that obligations and responsibilities defined under the contract are met. The study also revealed that monitoring of the service providers' performance against the output specification is undertaken to ensure the financial implications of any failure to perform has been taken in to account. Further, the study found out that contract management helps to minimize the rate of power outages and losses. In addition, the study noted that the firms in electricity energy sub-sector chain have explicit standards and measures of performance between different stakeholders. However, the study found out that the

actors in electricity energy sub-sector have a moderate efficient and secured sources for collecting and analyzing customers complains and providing the feedback. The study also revealed that most firms in electricity energy sub-sector are faced with the problem of quality material and inadequate skills and capacity.

Further, the study established that contract management practice showed a weak positive correlation with the performance of firms in electricity energy sub-sector in Kenya. Additional results on regression indicated that contract management revealed a variation in the performance of firms in electricity energy sub-sector in Kenya and the regression model was a good fit. The standardized regression coefficient for contract management indicated that a unit increase in the contract management would result in twenty-eight percent increase in the performance of firms in electricity energy sub-sector in Kenya. Thus, contract management was significant and the null hypothesis (H_{04}) was rejected. Therefore, contract management has a significant influence on the performance of firms in electricity energy sub-sector in Kenya.

The study also revealed several challenges facing firms in electricity energy sub-sector which included; ethical issues, leadership, political interference, quality of materials, resources, climate change and infrastructure. Further the study provided several solutions to the identified challenges facing firms in electricity energy sub-sector which included; adherence to ethical codes and regulations, having in place industrial leaders, having diverse sources of power being independent of political issues, sourcing quality products and putting in place risk mitigation measures.

5.2.5 Moderating effect of Procurement Regulations Compliance on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Based on the study findings, it was established that procurement regulations enhance transparency and accountability in sourcing, contract management and supply chain risk management. The study also established that procurement compliance, supply chain risk management, strategic sourcing, contract management and demand forecasting jointly explain twenty-three percent variation in performance of firms in electricity energy sub-sector in Kenya. This regression model one was a good fit. Upon introduction of the interaction term, the model was still significant inferring that

procurement regulations compliance significantly moderated the relationship between supply chain management practices and performance of firms in electricity energy sub-sector in Kenya. Further, the results indicated that the inclusion of the interaction term showed presence of significant moderating effect. This implied that the moderating effect of procurement regulations compliance gained thirty-seven percent variance in the performance of firms in electricity energy sub-sector in Kenya, above and beyond the variance by supply chain management practices. Thus, the study rejected the null hypothesis (H_{05}).

5.3 Conclusions

5.3.1 Influence of Demand Forecasting Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Based on demand forecast objective, the study concludes that firms in electricity energy sub-sector in Kenya scan the operating environment in order to conduct accurate forecasts since macro environmental factors have an impact on forecasting. Equally, the study concludes that some firms in electricity energy sub-sector in Kenya shares consumption rate data and organizations communication systems are closely integrated for effective sharing of forecast information. The study also concludes that firms in electricity energy sub-sector recognizes the need for collaborations with supply chain partners to create a more accurate forecast of their clients' requirements. However, the study concludes that majority of firms in electricity energy sub-sector in Kenya do not share information with trade partners. Additionally, the study concludes that demand forecasting positively influences the performance of firms in electricity energy sub-sector in Kenya. Thus, demand forecasting was significant and the null hypothesis (H_{01}) was rejected.

5.3.2 Influence of Strategic Sourcing Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Regarding strategic sourcing the study concludes that majority of firms in electricity energy sub-sector have adopted multiple sourcing strategy to acquire materials as a way of spreading risks. The study also concludes that firms in electricity energy sub-

sector in Kenya use different approaches in negotiation with suppliers. Further, it concludes that strategic sourcing optimizes the firms supply base. Equally, the study concludes that firms in electricity energy sub-sector in Kenya have incorporated customer needs in strategic sourcing such as on time delivery. In addition, the study concludes that buying a wrong item or service or buying from a wrong supplier can have a major impact on product or service offerings by firms in electricity energy sub-sector and thus the adoption of sourcing decisions based on set guidelines by the organizations. Further, it was concluded that the sourcing decisions of one organization in the electricity energy sub-sector can also impact other organization's processes and thus the need for collaboration in decision making. The study also concludes that strategic sourcing increases the performance of firms in electricity energy sub-sector in Kenya. Thus, strategic sourcing was significant and the null hypothesis (H_{02}) was rejected.

5.3.3 Influence of Supply Chain Risk Management Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Concerning supply chain risk management objective, the study concludes that majority of electricity energy sub-sector operational activities have been hampered by a number of activities such as demand changes, plans alterations, changes in time scheduled for activities and sometimes operations are affected by policy changes. Also, the study concludes that in electricity energy sub-sector, supply chain risks can cause detrimental effects on supply chain production and cancellation of clients' orders. The study also concludes that organizations have adopted different strategies such as alliances, e-procurement, integrated supply chains and collaborations to manage risks. Likewise, the study concludes that assessment of risks is carried out regularly within firms in electricity energy sub-sector. The study also concludes that electricity energy sub-sector' stakeholders are regularly trained on risk management issues, however regular sharing of supply chain risk information with partners in electricity energy sub-sector is taken reluctantly. The study concludes that supply chain risk management influence positively the performance of firms in electricity energy sub-sector in Kenya. Thus, supply chain risk management was significant and the null hypothesis (H_{03}) was rejected.

5.3.4 Influence of Contract Management Practice on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

On contract management objective, the study concludes that majority of the firms in electricity energy sub-sector have put in place contract management teams to help them in ensuring materials and services delivered meet the required standards. Also, the study concludes that contract administration in electricity energy sub-sector firms in Kenya ensures that obligations and responsibilities defined under the contract are met. The study also concludes that monitoring of the services providers' performance against the output specification is undertaken to ensure the financial implications of any failure to perform has been taken in to account. Further, the study concludes that contract management helps to minimize the rate of power outages and losses. In addition, the study concludes that firms in the electricity energy sub-sector have explicit standards and measures of performance between different stakeholders, however a considerable number of firms along the chain in electricity energy sub-sector do not have an efficient and secured sources for collecting and analyzing customers complains and providing the feedback. The study also concludes that most firms in electricity energy sub-sector are faced with the problem of quality material and inadequate skills and capacity. The study concludes that contract management positively influences the performance of firms in electricity energy sub-sector in Kenya. Hence, contract management was significant and the null hypothesis (H_{04}) was rejected. The study further concludes that most firms in electricity energy sub-sector in Kenya face several challenges including but not limited to ethical issues, leadership, political interference, quality of materials, resources, climate change and infrastructure.

5.3.5 Moderating effect of Procurement Regulations Compliance on Performance of Firms in the Electricity Energy Sub-Sector in Kenya

Lastly, basing on the moderating effect of procurement regulations compliance, the study concludes that procurement regulations enhance transparency and accountability in sourcing, contract management and supply chain risk management. It also concludes that supply chain risk management, strategic sourcing, contract

management, demand forecasting and procurement regulations compliance, jointly shows a moderate variation in performance of firms in electricity energy sub-sector in Kenya. This regression model one was a good fit. Upon introduction of the interaction term, the model was still significant inferring that procurement regulations compliance significantly moderated the relationship between supply chain management practices and performance of firms in electricity energy sub-sector in Kenya.

Further, the study concludes that the inclusion of the interaction term resulted into a greater change, showing presence of significant moderating effect. This implied that the moderating effect of procurement regulations compliance enhanced the performance of firms in electricity energy sub-sector in Kenya, above and beyond the variance by supply chain management practices. Thus, the study rejected the null hypothesis (H_{05}).

5.4 Recommendations

The study suggests the following recommendations:

5.4.1 Managerial Recommendations

Based on demand forecast objective, it was revealed from the study that majority of the firms in electricity energy sub-sector in Kenya do not share information with trade partners. The study recommends that in future, firms in electricity energy sub-sector should share information with other stakeholders such as first tier suppliers, second tier suppliers, industrial and household customers in order to meet the needs of all the stakeholders in the chain. Equally, the study found out that some firms in electricity energy sub-sector' found the need to collaborate with supply chain partners in order to create a more accurate forecast. Therefore, the study recommends to all firms in electricity energy sub-sector to collaborate and share information in order to achieve a more accurate forecast. This is because from the study findings it was established that demand forecasting positively influences the performance of firms in electricity energy sub-sector.

Regarding strategic sourcing objective, the study recommends that firms in electricity energy sub-sector should adopt sourcing strategies that suits their needs and requirements. However, firms that have adopted multiple sourcing strategies should be cautious since it might be very expensive to manage many suppliers. The study also, recommends to the management team of the firms in electricity energy sub-sector that they should adopt strategic sourcing as a way of optimizing their supply base. Equally, the study recommends to the management to incorporate customer needs in their strategic sourcing such as on time delivery. The study also, recommends clear criteria for selecting suppliers and preparation of clear specification to avoid purchasing wrong items. The study also recommends to the management of some firms in electricity energy sub-sector to keep on developing organizations' sourcing strategies in line with the Public Procurement and Disposal of Assets Act 2015 and Public Procurement and Disposal of Assets Regulations 2020, because it was noted from the study that sourcing strategies improve performance of firms in electricity energy sub-sector positively.

Concerning supply chain risk management objective, the study recommends that the management teams of the firms should be aware of risks such demand changes, sudden plan alterations, changes in time schedule which affect their operations negatively on day-to-day basis. These risks were found to affect the operations of firms in the study. Also, the study recommends to the firms' management team, that it's important to regularly share information on supply chain risks and their consequences to all the stakeholders so as to come up with ways of preparing for those risks which cannot be avoided and mitigate their impact and avoid others. From the study it was established that supply chain risk management influence positively the performance of firms in electricity energy sub-sector in Kenya.

On contract management objective, the study recommends to management team of the firms in electricity energy sub-sector that they should create efficient and secured sources for collecting and analyzing customers complains and providing feedback along the electricity energy sub-sector. Equally the study recommends that contract management teams should be more vigilant in ensuring that materials and services delivered meet the required standards. This is due to the fact that, the study found out

that most firms in electricity energy sub-sector are faced with the problem of quality materials, inadequate skills and capacity and it was noted from the study that contract management influence performance of firms positively.

The study further recommends to the management team the need for adherence to ethical codes and regulations by all the players, having industrial leaders in strategic positions and having diverse sources of power. This is due to the fact that the study found out that most firms in electricity energy sub-sector in Kenya faced challenges which included; ethical issues, leadership and quality of materials.

Lastly, basing on the moderating effect of procurement regulations compliance objective, the study recommends that management teams of firms in electricity energy sub-sector in Kenya should execute supply chain management practices within the legal framework of Public Procurement and Assets Disposal Act and other related regulations and policies. This is because it was found from the study that upon introduction of the interaction term of moderating factor (procurement regulations compliance), the model was still significant inferring that procurement regulations compliance significantly moderated the relationship between supply chain management practices and performance of the firms in electricity energy sub-sector in Kenya.

5.4.2 Policy Recommendations

Supply chain management practices play a crucial role in an organization's profitability and enhances stakeholders value and public sector organizations are expected to achieve high performance standards in public provision. From the study findings it was established that supply chain management practices such as demand forecasting, strategic sourcing, supply chain risk management and contract management positively influence performance of the firms in electricity energy sub-sector in Kenya. Thus, the study recommends that firms in electricity energy sub-sector in Kenya should embrace and adopt these practices to achieve good performance. The study also recommends to the policy makers in the electricity energy sub-sector to have explicit standards and measures of performance between different stakeholders

in their contracts. This would also prevent power outage which is experienced frequently.

5.4.3 Contribution to Theory and New Knowledge

The theories that provide the foundation of this study include the systems theory, strategic decision theory, network theory, relational contract theory, and the supply chain operations reference model. The study provided a detailed comprehension of how the implementation of these theories affects the performance of firms in Kenya's electrical sector. The text emphasized the intricate interaction of internal decision-making, network dynamics, contractual structures, and operational efficiency. In addition, through the application these theories to the specific context of Kenya, the study might uncover distinct obstacles and opportunities in the electrical supply chain. It has the potential to aid in the creation of specialized supply chain management (SCM) guidelines for the electrical industry in countries that are developing. The findings can enhance current ideas by showcasing their actual implementation in a real-life context.

Prior studies on supply chain management (SCM) in electrical supply chains were broad in scope and primarily concentrated on industrialized nations. This study yielded significant insights into the operational mechanisms of these practices within the distinct framework of the energy sub-sector in Kenya. Variables such as constraints in infrastructure, regulatory framework, and prevailing sources of energy generation (such as hydro or geothermal) may impact the efficiency of any approach. The study examined the individual impact of each independent variable (Demand Forecasting, Strategic Sourcing, Supply Chain Risk Management, and Contract Management) on the overall performance of organizations. The hierarchy of significance may vary in different industries or geographical areas. For instance, given the crucial importance of energy supply, risk management may have a greater significance in Kenya comparable to a more developed market. The study also investigated how other factors influence the link between both dependent and independent variables. For example, the success of Strategic Sourcing in the Kenyan electrical sector may depend on the extent to which technology is adopted. The study elucidated the influence of particular

supply chain management (SCM) techniques on the performance of Kenyan power providers, thereby providing valuable insights for the formulation of optimal practices. This could be especially beneficial for Independent Power Producers (IPPs) that are entering the market or for enhancing the effectiveness of existing players such as Kenya Power. Additionally, the investigation could confirm the validity of current knowledge regarding these supply chain management strategies within the electrical industry. This would enhance the applicability of these approaches in many contexts.

5.4.4 Areas for Further Research

The study was confined to a literature review that only proposes demand forecasting, strategic sourcing, supply chain risk management, contract management and procurement regulations compliance and the theories that support these variables. Therefore, similar study should be conducted using different variables to establish which other variables influences performance of firms in electricity energy sub-sector in Kenya. Similarly, the data was collected from the firms in electricity energy sub-sector in Kenya. However, there are other organizations both in public and private sectors in Kenya which supply chain management practices can affect. Thus, informant representatives of participating firms in electricity energy sub-sector in Kenya may be biased. This study recommends similar research to be conducted from multiple informants' groups from different sectors in Kenya to come up with a variety of outcomes. Likewise, the study adopted cross-sectional descriptive survey design which was limited to a point-in-time assessment. Therefore, future research can be conducted using longitudinal research so as to establish factors which influence performance of firms in the electricity energy sub-sector in Kenya.

REFERENCES

Achieng', E., & Rotich, G. (2013). Factors affecting effective distribution of petroleum products in Kenya: A case of Kenya pipeline company. *International journal of social sciences and entrepreneurship, 1(7*), 579-600.

Adebayo, I. (2012). Supply chain management practices in Nigeria today: Impact on supply chain management performance. *European journal of business and social sciences, 1*(6), 107-115.

Adem, E. (2014). *Supply chain risk management practices and disruptions control in power supply Kenya.* Retrieved from http://hdl.handle.net/11295/76113

Adusei, C., & Awunyo-Vitor, D. (2014) Determinants of Stock-Out in Retail Shops in Ghana: Evidence from Kumasi Metropolis. *Modern Economy*, 5(13), 1240-1252.

Africa Development Bank. (2014). *Kenya Country Strategy Paper*. Retrieved from www.afdb.org

Agostinho, C. F. (2013). Humanitarian logistics: How to help even more? *IFAC Proceedings Volumes*, *46*(24), 206-210.

Ahimbisibwe, A., Sebulime, R., Tumuhairwe, R., & Tusiime, W. (2016). Supply chain visibility, supply chain velocity, supply chain alignment and humanitarian supply chain relief agility. *European Journal of Logistics, Purchasing and Supply Chain Management, 4(2), 34-64.*

Akintokunbo, O. O., & Ali, F. O. (2021). Supply chain visibility and sales performance of oil and gas multinational companies in Rivers State. *The Strategic Journal of Business & Change Management, 8 (4), 966 – 973.*

Alam, A., Bagchi, P., Kim, B., Mitra, S., & Seabra, F. (2012). Supply Chain Integration and its Effect on Performance: A multicounty Study. *PPMS 23rd Annual Conference.* Chicago Illinois.

Albarune, A. (2015). A study of forecasting practices in supply chain management. *International Journal of Supply Chain Management, 3*(31), 473-483.

Ali, M.M., & Boylan, J.E. (2010). The value of forecast information sharing in supply chains. Foresight: *The International Journal of Applied Forecasting, 18(14), 14-18*

Alshawabkeh, R., AL-Awamleh, H., Alkhawaldeh, M., Kanaan, R., Al-Hawary, S., Mohammad, A., & Alkhawalda, R. (2022). The mediating role of supply chain management on the relationship between big data and supply chain performance using SCOR model. *Uncertain Supply Chain Management, 10*(3), 729-736.

Aluonzi, G., Oluka N. P., & Nduhura, A. (2016). Contract Management and Performance of Road Maintenance Projects: A Case of Arua Municipality. *Universal Journal of Management 4(10),550-558.*

Amajor, C., Smith, M., & Moreland, E. (2015). *Tales from the Trenches: Evolution of Strategic Sourcing.* Retrieved from: www.naspo.org

Ambe, I. M. (2016). Public procurement trends and developments in South Africa. *Research Journal of Business and Management-(RJBM), 3*(4), 277-290.

Ambe, I. (2009). An exploration of supply chain management practices in the central district municipality. *Educational research and review, 4(2),* 427-435.

Ambe, I. M. & Migiro S. O. (2008). Evaluation of the implementation of public sector supply chain management and challenges: A Case Study of the Central District Municipality, North West Province, South Africa. *African Journal of Business Management, 2 (12), 30-242.*

Ambe, I.M., & Badenhorst-Weiss, J.A. (2012). Procurement challenges in the South Africa public sector: *Journal of Transport and Supply Chain Management, 6*(1), 242-261.

Ambulkar, S., Blackhurst, J., & Grawe, S. (2015). Firm resilience to supply chain disruptions: Scale development and empirical examination. *Journal of operations management, 3*(3), 111-222.

Armistead, C., & Pettigrew, P. (2004). Effective partnerships: building a sub-regional network of reflective practitioners. *International Journal of Public Sector Management, 17*(7), 571-585.

Andrews, I., & Barron, D. (2016). The allocation of future business: Dynamic relational contracts with multiple agents. *American Economic Review, 106*(9), 2742-2759.

Arani, W., Mukulu, E., Waiganjo, E., & Musyoka, J. (2015). Enhancers for building supply chain resilience in manufacturing firms in Kenya. *The strategic journal of business and change management, 2*(71), 709-749.

Arasa.R, & Kahiri.J. (2014). Procurement policies and implementationof effective practices in tertiary public training institutions in Kenya. *Global Advanced Research Journal of Management and Business Studies, 3*(4), 166- 170.

Argyres, N., Bercovitz, J., & Zanarone, G. (2020). The role of relationship scope in sustaining relational contracts in inter firm networks. *Strategic Management Journal, 41*(2), 222-245.

Armstrong, G. (1988). Research needs in forecasting. *International Journal of Forecasting, 4*(3), 449-465.

Armstrong, J. S. (1988). Research needs in forecasting. *International Journal of Forecasting, 4*(3), 449-465.

Arnheiter, E., & Maleyeff, J. (2005). The Integration of lean management and six sigmas. *The TQM Magazine, 17*(1), 5-18.

Arvis, J., Ojala, D., Shepherd, L., Busch, B., & Raj, A. (2014). *Connecting to compete trade logisticism global economy: The logistics performance index and its indicators (Rep).* Washington DC: The World Bank.

Association of project management. (2016). *A guide to project management body of knowledge (PMBoK)* (6th ed.). (R. Murray, & D. Dulcher, Eds.) Newton square, Pennesylvania, USA: Project Management Institute Inc.

Attaran, M., & Attaran, S. (2007). Collaborative Supply Chain Management: The most promising practice for building efficient and sustainable supply chain. *Business Process Management Journal, 13*(3), 390-404.

Attaran, M., & Attaran, S. (2007). Collaborative supply chain management: the most promising practice for building efficient and sustainable supply chains. *Business process management journal*, *13*(3), 390-404.

Aucoin, P. (1990). Administrative reform in public management: paradigms, principles, paradoxes and pendulums. *Governance: an international journal of policy and administration*, *3*(2), 115-137.

Aucoin, P., & Peter, A. (1995). *The new public management: Canada in comparative perspective*. Montreal: Institute for Research on Public Policy.

Augustine, T. M., Ronoh, R. & Essandoh, P. (2021). A comprehensive review of energy scenario and sustainable energy in Kenya. *Fuel Communications Journal 7*(10), 1-13

Awino, Z. (2011). Strategic management an empirical investigation of selected strategy variables on firms' performance: A Study of supply chain management in large manufacturing firms in Kenya. *Prime journals, Business Administration and Management (BMA), 1*(1), 9-18.

Ayala, C., Burke, G., Mackelprang, A., & Dick, G. (2014). *"Effects of bullwhip on items and store level performance." Logistics and supply chain management faculty presentations.* Presentation, Decision Sciences Institute, Tampa, FL.

Retrieved from https://digitalcommons.georgiasouthern.edu/logostics-supply-facpres/6

Ayyildiz, E., & Taskin Gumus, A. (2021). Interval-valued Pythagorean fuzzy AHP method-based supply chain performance evaluation by a new extension of SCOR model: SCOR 4.0. *Complex & Intelligent Systems*, *7*, 559-576.

B, A. Z. (2011). Strategic Management an empirical investigation of selected strategy variables on firm's performance: A study of supply chain management in large manufacturing firms in Kenya. *Business Administrative and Management, 1*(1), 9-18.

Babbie, E. R. (2020). *The practice of social research*. Cengage AU.

Baily, P., Farmer, D., Jessop, P., & Jones, D. (2005). *Purchasing Principles and Management* (9th ed.). Prentice Hall. USA

Bank, W. (3013). *Guidelines to procurement under IBRD loans and IDA credits.* Washington DC: World Bank.

Barac, N., Milovanovic, G., & Andjelkovic, A. (2010). Lean Production and Six Sigma Quality in Lean Supply. *Economics and Organization, 7(3),* 319-334.

Baraldi, E., Proenca, J., Proenca, T., & Castro, L. (2014). The supplier's side of outsourcing: Taking over activities and blurring organizational boundaries. *Industrial Marketing Management, 43*(4), 553-563.

Barasa, P., Namusonge, G., & Iravo, M. (2015). Contributions of Green Supply Chain Practices on Performance of Steel Manufacturing Companies in Kenya. *International Knowledge Sharing Platform, 5*(19), 212-232.

Barasa, P., Namusonge, G., & Iravo, M. (2016). *Contributions of Green Supply Chain Practices on Performance of Steel Manufacturing Companies in Kenya.* Unpublished PhD. Thesis, Nairobi: Jomo Kenyatta University of Agriculture

and Technology, Nairobi. Retrieved from Jomo Kenyatta University of Agriculture and Technology.

Barlas, Y., & Gunduz, B. (2011). Demand forecasting and sharing strategies to reduce fluctuations and the bullwhip effect in supply chains. *Journal of Operation Research Society, 62(3),* 458-473.

Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of management, 17*(1), 99-120.

Barua, J. (2010). Challenges facing supply chain management in the oil marketing companies in Kenya. Nairobi. Unpublished PhD Thesis , Nairobi: University of Nairobi.

Basingstoke, & Deane. (2013). *Procurement and Contract Management strategy 2013-2017*. Retrieved from https://www.basingstoke.gov.uk

Bernardes, E., & Hanna, M. (2009). A theoretical review of flexibility, agility and responsiveness in the operations management literature. *Toward a conceptual definition of customer responsiveness, International Journal of Operations & Production Management, 29(1),* 30-53.

Bernstein, L. (2015). Beyond relational contracts: Social capital and network governance in procurement contracts. *Journal of Legal Analysis, 7*(2), 561-621.

Bertalanffy, L. V. (1950). Theory of open systems in physics and biology. *science, 111*(2872), 23-29.

Bertelli, A. M., & Smith, C. R. (2010). Relational contracting and network management. *Journal of Public Administration Research and Theory*, *20*(1), 21-40.

Bhardwaj, M. (2011). *Procurement and Contract Management.* Durban: Excel Learning Pty Ltd.

Bildsten, L. (2015). Purchasing strategies in industrialized building-A comparison of Australian and Swedish companies. In *8th Nordic Conference on Construction-Economics-and-Organization (CEO), 2015* (594-600).

Blackhurst, J., Dunn, K., & Craighead, C. (2011). An empirically derived framework of global supply resiliency. *Journal of Business Logistics, 32(4)*, 374-391.

Blackhurst, J., Scheibe, K., & Johnson, D. (2008). Supplier risk assessment and monitoring for the automotive industry. *International Journal of Physical Distribution & Logistics Management, 38(2)*, 143-165.

Boateng, D. (2012). *Improving Acquisition through Strategic Sourcing*. Retrieved from www.whitehouse.gov

Bolsche, D. (2013). *Performance measurement in humanitarian logistics.* Fulder: Fulder university of applied sciences.

Bondareva, M., & Pinker, E. (2019). Dynamic relational contracts for quality enforcement in supply chains. *Management Science*, *65*(3), 1305-1321.

Borac, D., Milovanovic, G., & Andjelkovic, A. (2010). *Lean production and Six Sigma Quality in Lean Supply Chain Management.* Presented to Ministry of Science and Technological Development, Republic of Serbia.

Box, G. E., & Jekins, G. (1976). *Time series analysis: Forecasting and control*. San Fracisco: Holden- Day.

Box, G. E., Jekins, G., & Reinsel, G. C. (1976). *Time series analysis: Forecasting and control* (4th ed.). San Fracisco: A Jonh Wiley &Sons INC.

Bradach, J. L., & Eccles, R. G. (1989). Price, authority, and trust: From ideal types to plural forms. *Annual review of sociology*, *15*(1), 97-118.

Brahm, F., & Tarzijan, J. (2016). Relational contracts and collaboration in the supply chain: impact of expected future business volume on the make-or-buy decision. *Journal of Supply Chain Management*, *52*(3), 48-67.

Brown, A., Stern, J., Tenenbaum, B., & Gencer, D. (2006). *Handbook for evaluating infrastructure regulatory systems.* Washington DC. World Bank Publications.

Bryman, A. (2012). *Social research methods* (4th ed.). New York: Oxford University press.

Buatsi, P., & Mbohwa, C. (2014). The Journey to Humanitarian Supply Network Management - An African Perspective. *Humanitarian Logistics*, 151-173.

Burker, G. (2005). *Sourcing Strategies in a supply chain.* PhD Thesis, University of Florida.

Burker, G., Carrillo, J., & Vakharia, A. (2007). Single vs Multiple Supplier Sourcing Strategies. *European journal of operations research, 189*(1), 317-329.

Buttle, F. (2009). *Customer Relationship Management* (2 ed.). New York: Elsevier Limited.

Calitz, M. (2009). *Chapter 5 pilot study 1 introduction.* Retrieved from <http:/uir.unisa.ac.za/bitstream/handle/10500/1648/06chapter5.pdf

Cantor, E., Blackhurst, J., Pan, M., & Crum, M. (2014). Examining the role of stakeholder pressure and knowledge management on supply chain risk and demand responsiveness. *The International Journal of Logistics Management, 25(I)*, 202-223.

Chan, F., & Qi, H. (2003). An innovative performance measurement method for supply chain management. Supply chain management. *An International Journal, 8(3)*, 209-223.

Changalima, I. A., & Mdee, A. E. (2023). Procurement skills and procurement performance in public organizations: The mediating role of procurement planning. *Cogent Business and Management, 10*(1), 2163562.

Charles, P. (2007). Supply Chain Postponement and Speculation Strategies: How to choose the right strategy. *Journal of Business Logistics, 21*(2).

Chartered institute of purchasing and supply, (2012). *Management in supply chain and supply chain.* Easton house on the Hill, Stamford: Profex Publishing.

Chen, R., Rao, Z., Liu, G., Chen, Y., Liao, S. (2019). The long-term forecast of energy Demand and uncertainty evaluation with limited data for energy-imported cities in China: A case study in Hunan. *Energy Procedia*, 160,396–403.

Chepng'etich, C., Waiganjo, E., & Karani, A. (2016). Influence of Strategic Sourcing on Organizational Performance of State Corporation in Kenya: A Case of Kenya Power. *International Journal of Management and Commerce Innovations, 3(2),* 127-137.

Chindia, E., Wainaina, G., Kibera, F., & Pokhariyal, G. (2014). Forecasting techniques, operating environment and accuracy of performance forecasting for large manufacturing firms in Kenya. *International journal of managerial studies and research, 2*(7), 83-100.

Choi, K., Ram, N., &Soo, W.K. (2012). Postponement Strategy for International Transfer of Products in Global Supply Chain. A Systematic Dynamics Examination. *Journal of Operations Management, 3(7), 167-179.*

Chopra, P., & Meindl, S. (2001). *Supply chain management.* Upper: Prentice Hall.

Chopra, S., & Meindel, P. (2015). *Supply Chain Management: Strategy, planning and Operations* (5th ed.). London: Pearson. Chopra, S., & Meindel, P. (2015). *Supply Chain Management: Strategy, planning and Operations* (5th ed.). London: Pearson.

Chopra, S., & Meindl, P. (2003). *Supply Chain Management.* Prentice Hall, USA.

Chopra, S., & Meindl, P. (2011). *Supply Chain Management* (4th ed.). Dorling Kindersley: Pvt Ltd.

Chopra, S., & Meindl, P. (2015). *Supply Chain Management: Strategy, Planning, and Operation* (6 ed.). New Delhi: Dorling Kindersley.

Chopra, S., Meindl, P., & Kalra, V. (2007). *Supply chain management: strategy, planning and operation.* New Delhi: Dorling Kindersley.

Christian, G. (2007). *Service Management and Marketing Customer Management in Service competition.* (3 ed.). Chichester: John Wiley & Sons Limited

Christopher, M. (1998). *Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service* (2 ed.). London: Prentice Hall

Christopher, M. (2000). The Agile Supply Chain: Competing in Volatile Markets. *Industrial Marketing Management, 29(1),* 37-44.

Christopher, M. (2005). *Logistics & SCM-Creating Value-addition networks* (3 ed.). London: Prentice Hall.

Christopher, M. (2016). *Logistics and Supply Chain Management: Logistics & Supply Chain Management* (5th ed.). New York: Prentice Hall.

Christopher, M., & Gattorna, J. (2005). *Industrial Marketing Management, 34(2),* 115-121.

Christopher, M., & Holweg, M. (2011). Supply chain: Managing supply chains in the era of turbulence. *International Journal of Physical Distribution & Logistics Management, 41(1),* 63-82.

Christopher, M., & Lee, H. (2004). Building the resilient Supply Chain. *An International Journal of Logistics Management, 15, (2),* 1-13.

Christopher, M., & Lee, M. (1998). Mitigating supply chain risk through improved confidence. *International Journal of Physical Distribution, 34(5),* 388-429.

Christopher, M., Mena, C., Khan, O., & Yurt, O. (2012). Approaches to managing global sourcing risk. Supply Chain Management. *An International Journal of Logistics Management, 7*(6), 67-81.

Christopher, M., Peck, H., & Towill, D. (2006). A taxonomy for selecting global supply chain strategies. *The International Journal of Logistics Management*, 277-287.

Cohen, J., Cohen, P., West, G., & Ailan, S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences.* London: Lawrence Erlbaum Associates.

Cooper, D., & Schindler, P. (2011). *Business Research Methods* (11th ed.). New York: McGraw-Hill.

Cooper, M.C., Lambert, D.M. & Pagh, J.D. (2013). Supply chain management: More than a new name for logistics. *International Journal of Logistics Management, 8 (1), 57-69.*

Council of Supply Chain Management Professionals (CSCMP, 2018). *Available at: cscmp.org.*

Cousins, P. L., Lawson, B., & Squire, B. (2008). *Strategic Supply Management.* London: Pearson Education.

Craighead, C., Blackhurst, J., Rungtusanatham, M., & Handfiel, R. (2007). The severity of supply chain disruptions: Design characteristics and mitigation capabilities. *Decision Sciences*, 131-156.

Creswell, J. (2013). *Research design: Qualitative, quantitative and mixed methods approach* (4 ed.). Los Angeles: Sage.

Culli, D., & Wu, S. (1981). Stock Control with two suppliers and normal lead times. *Journal of the Operational Research Society, 3*(2), 1003-1019.

Cuthberton, R. & Piotrowicz W. (2011). Performance Measurement Systems in Supply Chains: A Framework for Contextual Analysis. *International Journal of Productivity and Performance Management, 6*(4), *583-602.*

Daft, R. (1983). Learning the craft of organizational research. *Academy ofManagement Review*, 539-546.

Day, G. (2000). Managing Market Relationships. *Journal of the Academy of Marketing Science*, *14* (7), 24-30.

Dekker, H. C., Sakaguchi, J., & Kawai, T. (2013). Beyond the contract: Managing risk in supply chain relations. *Management Accounting Research*, *24*(2), 122-139.

Delipinar, G. E., & Kocaoglu, B. (2016). Using SCOR model to gain competitive advantage: A Literature review. *Procedia-Social and Behavioral Sciences*, *2*(29), 398-406.

Desouza, K., & Kraft, G. (2003). Supply chain perspectives to knowledge management: research propositions. *Journal of knowledge Management*, *1*(29), 129-138.

Diathesopoulos, M. D. (2012). Relational contract theory and management contracts: A paradigm for the application of the Theory of the Norms. In *Relational Contract Theory and Management Contracts: A Paradigm for the Application of the Theory of the Norms: Diathesopoulos, Michael D*. [Sl]: SSRN.

Dissanayake, C. K., & Cross, J. A. (2018). Systematic mechanism for identifying the relative impact of supply chain performance areas on the overall supply chain performance using SCOR model and SEM. *International Journal of Production Economics*, *20*(1), 102-115.

Domah, P., & Pollit, M. (2001). The restructuring and privatization of the electricity distribution and supply businesses in England and Wales. *A social cost benefit analysis fiscal studies*, 107-146.

Dubois, A., & Fredriksson, P. (2008). Cooperating and competing in supply networks: Making sense of a triadic sourcing strategy. *Journal of Purchasing and Supply Management*, 1(7), 709-720.

Dubois, A., & Gadde, L. (2002). Systematic combining: An abductive approach to case research. *Journal of Business Research, 5*(8), 553-600.

Dubois, A., & Gibbert, M. (2010). From complexity to transparency: managing the interplay between theory, method and empirical phenomena in IMM case studies. *Industrial Marketing Management, 3*9(10), 129-136.

Duffie, T., & Koester, L. (2005). Strategic Sourcing: Building a foundation for success -understanding the difference between sourcing and strategic sourcing and its impact. *UPS Supply Chain Solutions White Paper*.

Easton, G. (2010). Critical realism in case study research. *Industrial Marketing Management, 39*(10), 118-128.

Ehrenthal, J.C.F., Gruen, T.W. & Hofstetter, J.S. (2014). Value-Attenuation and Retail Out-of-Stocks: A Service Dominant Logic Perspective. *International Journal of Physical Distribution & Logistics Management, 44, 32-57*

Energy Regulatory Commission. (2010). *Feed-in-Tariffs Policy on Wind, Biomass, Geothermal, Biogas and Solar Resource Generated Electricity, Nairobi.*

Faes, W., & Matthyssens, P. (2009). Insights into the process of changing sourcing strategies. *Journal of Business & Industrial Marketing*, 245-255.

Faes, W., Matthyssens, P., & Vanstraelen, K. (2005). From single to multiple sourcing and vice versa: Insights into the process of changing strategies. *14th Annual IPSERA Conference.* Archamps, France.

Fauziyah, I. S., Ridwan, A. Y., & Muttaqin, P. S. (2020, December). Food production performance measurement system using halal supply chain operation reference (SCOR) model and analytical hierarchy process (AHP). In *IOP Conference Series: Materials Science and Engineering* (Vol. 909, No. 1, p. 012074). IOP Publishing.

Fawcett, S. (2007). *Supply Chain Management: From Vision to Implementation.* New Jersey: Pearson Prentice Hall.

Ferrer, M., Santa, R., Hyland, P. W., & Bretherton, P. (2010). Relational factors that explain supply chain relationships. *Asia Pacific Journal of Marketing and Logistics, 22*(3), 419-440.

Findlay, S. (2018). A companys reactions to inadequate providers and upper hand. *Journal of Business Research, 59*(4), 686-695.

Fliender, G. (2001). Hierarchical Forecasting: Issues and Use Guidelines. *Industrial Management and Data Systems, 101*, 5-12.

Fliender, G. (2014). Collaborative Supply Chain Forecasting: A lean Framework. *Alliance Journal of Business Research,* 45-56.

Ford, D., Gadde, L., Hakansson, H., & Snehota, L. (2011). *Managing Business Relationships* (3 ed.). Chichester: John Wiley.

Friemann, F., & Verhasselt, S. (2012). Best Practices for supply chain management techniques and cocepts across industries. *POMS 23rd annual conference.* Chicago, Illinois.

Frohlich, M., & Westbrook, R. (2001). Areas of Integration: An international study of Supply Chain Strategies. *Journal of Operations Management, 9*, 185-200.

Gadde, L., & Snehota, I. (2000). Making the most of supplier relationships. *Industrial Marketing Management, 29*, 305-316.

Gadde, L., Hakansson, H., & Persson, G. (2010). *Supply Network Strategies* (2 ed.). Chichester: John Wiley & Sons Limited.

Ganji Jamehshooran, B., Shaharoun, M., & Norehan Haron, H. (2015). Assessing supply chain performance through applying the SCOR model. *International Journal of Supply Chain Management, 4*(1), 1-11.

Garson, G., & Overman, E. (1983). *Public management research in the United States.* New York: Praeger.

Gattorna, J. (2006). *Living supply chains-how to mobilize the enterprise around delivering what your customer wants.* London: Prentice Hall.

Ghadge, A., Dani, S., Chester, M., & Kalawsky, R. (2013). A systems approach for modelling supply chain risks. *Supply chain management: an international journal*, *18*(5), 523-538.

Ghauri, P., Gronhaug, K., & Strange, R. (2005). *Reseach Methods in Business Studies.* Cambridge University Press.

Gibbons, R., & Henderson, R. (2012). Relational contracts and organizational capabilities. *Organization science*, *23*(5), 1350-1364.

Gil, N. (2009). Developing cooperative project client-supplier relationships: How much to expect from relational contracts? *California management review*, *51*(2), 144-169.

Gilliland, M. (2002). Is Forecasting a Waste of Time. *Supply Chain Management Review July-August*, pp. 16-23.

Giunipero, L. C., & Aly Eltantawy, R. (2004). Securing the upstream supply chain: a risk management approach. *International journal of physical distribution & logistics management*, *34*(9), 698-713.

Golden, M. A., & Min, B. (2012). *Theft and loss of electricity in an Indian state*. International Growth Centre.

Government of Kenya. (2008). *Vision 2030, Ministry of State for Planning, National Development.* Nairobi: Government Printers. Retrieved from Vision 2030.

Government of Kenya. (2011). *Updated Least Cost Power Development Plan, Study Period 2011-2031.*Retrieved from www.renewablenergy.go.ke

Government of Kenya. (2013). *Kenya Energy Sector Development Strategy.* Retrieved from www.energy.go.ke

Government of Kenya. (2013). *Second Medium Term Plan 2013-2017.* Retrieved from www.vision2030.go.ke

Government of Kenya. (2015). *Power Sector Medium term plan, 2015-2020.* Retrieved from www.vision2030.go.ke

Government of Kenya. (2015). *Sustainable energy for all Kenya action agenda: Pathways for Concerted Action towards Sustainable Energy for All by 2030.* Ministry of Energy and Petroleum, Nairobi. Retrieved from www.se4all.org

Government of Kenya. (2016). *Kenya's Investment Prospectus, Nairobi.* Retrieved from Ministry of Energy and Petroleum: www.renewablenergy.go.ke

Government of Kenya. (2016). *Sustainable Energy for all: Kenya Action Agenda. Pathways for Concerted Action Toward Sustainable Energy for All by 2030.* Nairobi. Retrieved from www.ke.undp.org

Govindan, K., Fattahi, M. & Keyvanshokooh, E. (2017). Supply chain network design under uncertainty: *A comprehensive review and future research directions. European Journal of Operational Research, 263(1), 108- 141*.

Grafton, J., & Mundy, J. (2017). Relational contracting and the myth of trust: Control in a competitive setting. *Management Accounting Research*, *36,* 24-42.

Groznika, A., & Trkman, P. (2012). Current issues and challenges of supply chain management. *Economic research, 25*(4), 1101-1112.

Gugler, K., Liebensteiner, M. & Schmitt, S. (2017). Vertical disintegration in the European electricity sector: Empirical evidence on lost synergies. *International Journal of Industrial Organization, 52, 450-478.*

Gunasekaran, A., Patel, C., & McGaughey, R. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 333-347.

Haakansson, H. (1987). *Industrial Technological Development: A Network Approach.* London: Croom Helm.

Haakansson, H., & Ford, D. (2002). How companies interact in business networks. *Journal of Business Research*, 133-139.

Haakansson, H., & Snehota, L. (1995). *Developing Relationships in Business Networks.* London: Routledge.

Habib, B. (2014). Supply Chain Management (SCM): Its Future Implications. *Open Journal of Social Sciences 2, 238-246*

Habib, M. (2011). *Supply Chain Management: Theory and Evolution.* Croatia: InTech Open Access.

Habib, M. (2016). *Supply Chain Management (SCM): The Latest Innovation in Research* 3

Halldorsson, A. (2002). *Third party logistics: a means to configure logistics resources and competencies.* Frederiksberg: Copenhagen Business School.

Haria, B. (2016). *An assessment of market and macro factors that affect forecasting in fast moving consumer goods companies – A case study of GlaxoSmithKline* (Thesis). Strathmore University Retrieved from http://su-plus.strathmore.edu/handle/11071/4755.

Harland, C., & Knight, L. (2001). Supply network strategy: role and competence requirements. *International Journal of Operations & Production Management, 21(4)*, 476-489.

Harper, C. M. (2014). *Measuring project integration using relational contract theory* (Doctoral dissertation, University of Colorado at Boulder).

Harper, C. M., & Molenaar, K. R. (2014). Association between construction contracts and relational contract theory. In *Construction research congress 2014: Construction in a global network* (pp. 1329-1338).

Harrison, A., & Hork, R. (2011). *Logistics Management and Strategy: Competing through the Supply Chain* (4th ed.). New Jersey: Prentice Hall.

Hasan, A. (2013). Sustainable supply chain management practices and operational performance. *American Journal of Industrial and Business Management, 3, 42-48*

Heizer, J., & Render, B. (2017). *Operations Management: Sustainability and Supply Chain Management.* Pearson Education South Asia Pte Limited.

Hines, P. (1995). Network Sourcing: A Hybrid Approach. *International Journal of Purchasing and Materials Management*, 17-24.

Hines, P., & Taylor, D. (2000). *Going Lean.* Cardiff: Lean Enterprise ResearchCentre.

Hirani, N. (2015). Evaluating the implementation of energy and transportation projects using Public Private Partnership (PPP) model in Kenya: A multiple case study Doctoral dissertation. Nairobi, Kenya.

Höhn, M. I. (2009). *Relational supply contracts: optimal concessions in return policies for continuous quality improvements* (Vol. 629). Springer Science & Business Media.

Höhn, M. I., & Höhn, M. I. (2010). Relational Contracts. *Relational Supply Contracts: Optimal Concessions in Return Policies for Continuous Quality Improvements*, 35-54.

Holcomb, M.C., Ponomarov S.Y. & Manrodt, K.B. (2011). The relationship of supply chain visibility to firm performance. *Supply Chain Forum: An International Journal, 12(2), 32-45*

Holweg, M. (2007). The genealogy of lean production. *Journal of Operations Management, 25*(2), 420-437.

Houlihan, J. B. (1985). International supply chain management. *International journal for physical distribution logistics, 15,* 22-38.

Hwang, G., Han, S., Jun, S., & Park, J. (2014). Operational performance metrics in manufacturing process: based on SCOR model and RFID technology. *International Journal of Innovation, Management and Technology*, *5*(1), 50-55.

Ikasari, N., Sutopo, W., & Zakaria, R. (2020, October). Performance measurement in supply chain using SCOR Model in the lithium battery factory. In *IOP Conference Series: Materials Science and Engineering* (Vol. 943, No. 1, p. 012049). IOP Publishing.

Ikatrinasari, Z., Harianto, N., & Yuslistyari, E. (2020). Improvement of supply chain performance of printing services company based on supply chain operation references (SCOR) model. *Uncertain Supply Chain Management*, *8*(4), 845-856.

Institute of Economic Affairs. (2015). *Situational Analysis of Energy Industry, Policy and Strategy for Kenya.*

Iravo, M., Ongori, J., & Munene, C. (2013). Factors affecting the performance of hotels and restaurants in Kenya: A case of Kisii County. *Interdisciplinary Journal of Contemporary Research in Business*, *4*(12), 897-928.

Ireland, R., & Bruce, R. (2000). CPFR: Only the Beginning of Collaboration. *Supply Chain Management Review*, (1), 80-88.

Jacob, T., & Sorensen, E. (2011). Enhancing collaborative innovation in the public sector. *public administration review, 43*(8), 842-868.

Jagtap, M., & Kamble, S. (2020). An empirical assessment of relational contracting model for supply chain of construction projects. *International Journal of Managing Projects in Business, 13*(7), 1537-1560.

Jain, V., Kumar, S., Mostofi, A., & Momeni, M. A. (2022). Sustainability performance evaluation of the E-waste closed-loop supply chain with the SCOR model. *Waste Management, 147*, 36-47.

Jamasb, T., & Pollitt, M. (2005). Electricity market reform in the European union: Review of progress toward liberalization &integration. *The Energy Journal, 26*(1_suppl), 11-41.

Jamasb, T., Mota, R., Newberry, D., & Pollitt, M. (2004). *Electricity Sector Reform in Developing Countries: A Survey of Empirical Evidence on Determinants and Performance.* World Bank.

Jenkins, P. (1999). Difficulties encountered in community involvement in delivery under the new South African housing policy. *Habitat International, 23*(4), 431-446.

Jevremović, N. (2022). Enforcing Sustainability Clauses in Global Supply Chains with a Focus on Proactive and Relational Contract Theory: Case of SDG 12. *ZEuS Zeitschrift für Europarechtliche Studien, 25*(2), 393-418.

Johanson, J., & Mattsson, L. (1987). Inter-organizational relations in industrial systems: A network approach compared with the transaction cost approach. *Inter-organizational Studies of Management and Organization, 17*(1), 34-48.

Johnson, P. F., Leenders, M. R., & Fearon, H. E. (2006). Supply's growing status and influence: a sixteen-year perspective. *Journal of Supply Chain Management, 42*(2), 33-43.

Jones, J. (2006). *Reforming power markets in developing countries: what have we learned?* Washington DC: World Bank. Retrieved from World Bank.

Jones, T. C., & Riley, D. W. (1985). Using inventory for competitive advantage through supply chain management. *International Journal of Physical Distribution & Materials Management*, *15*(5), 16-26.

Kakwezi, P. (2012). Procurement Contract Management in Public Procurement and Disposal Entities (PDES). *The International Journal's Research Journal of Economics and Business Studies*, *2*(1), 230-240.

Kamband, C., & Mshana, L. (2021). *Country PriorityPlan and Diagnostic of the Electricity Sector. Kenya*. The Tony Blair Institute for Global Change.

Karekezi, S., & Kimani, J. (2004). Have power sector reforms increased access to electricity among the poor in East Africa? *Energy for Sustainable Development*, *8*(4), 10-25.

Karimi, E., & Rafiee, M. (2014). Analyzing the impact of supply chain management practices on organizational performance through competitive priorities (Case Study: Iran Pump Company). *International Journal of Academic Research in Accounting, Finance and Management Sciences*, *4*(1), 1-15.

Katri, K., Asta, S., Weimu, Y. (2017). Sourcing from Africa: A systematic Review and Research Agenda. *International Journal of Management Reviews. 20(10), 1111-1140.*

Ke, Y., Gajendran, T., & Davis, P. R. (2015). Relational contracting in the construction industry: mapping practice to theory. In *AEI 2015* (pp. 175-184).

Kenya Transmission Company. (2013). *The Kenya Electricity Transmission Company Newsletter.*

Kibogo, A.D. & Mwangangi, M. (2014). Factors Affecting Contract Management in Public Procurement Sector in Kenya: A case of Kenya Literature Bureau. *European Journal of Business Management, 1(110),377-384.*

Kihanya, T., Wafula, M., & Onditi, E. M. (2015). The Role of Strategic Sourcing on Organization's Performance: A Case Study of Jomo Kenyatta University of Agriculture and Technology. *International Journal of Scientific and Research Publications, 5*(5), 1-11.

Kilubi, I., & Haasis, H. (2015). Supply chain risk management enablers- A framework development through systematic review of literature from 2000-2015. *International journal of business and applied management, 10*(1), 35-54.

Kimechwa, V., Njeru, A., & Makau, G. (2015). Impact of Supply Chain Management Practices on the Performance of Banks in Kenya. *International Journal of Computer Application Technology and Research, 4*(7), 556-565.

Kimemia, E. W., & Moronge, M. (2018). Determinants of Collaborative Procurement Practices in the Energy Sector in Kenya: A Case Study of Kenya Electricity Transmission Company limited. *The Strategic Journal of Business & Change Management 5(4) 298-315.*

Kolani, J. S., & Miroga, J. B. (2019). Influence of contract management practices on supply chain performance of state corporations in the ministry of energy. *The Strategic Journal of Business & Change Management, 6 (4), 571 – 587*

Kothari, C. (2011). *Research Methodology: Methods and techniques* (2nd ed.). India: New Delhi.

Kusrini, E., Rifai, M. A. B., & Miranda, S. (2019, December). Performance measurement using supply chain operation reference (SCOR) model: a case study in a small-medium enterprise (SME) in Indonesia. In *IOP Conference Series: Materials Science and Engineering* (Vol. 697, No. 1, p. 012014). IOP Publishing.

Kwon, I. W. G., & Suh, T. (2005). Trust, commitment and relationships in supply chain management: a path analysis. *Supply chain management: an international journal*, *10*(1), 26-33.

Lambert, D. M. (2004). The eight essential supply chain management processes. *SUPPLY CHAIN MANAGEMENT REVIEW, V. 8, NO. 6 (SEPT. 2004), P. 18-26: ILL, 8*(6).

Lambert, D. M., & Cooper, M. C. (2000). Issues in supply chain management. *Industrial marketing management, 29*(1), 65-83.

Lambert, D., Emmelhainz, M., & Gardner, J. (1996). Developing and implementing supply chain partnerships. *International Journal of Logistics Management, 7*(2), 1-17.

Lamming, R. (1993). *Beyond partnership.* Hemel Hempstead: Prentice Hall.

Lamming, R., Johnsen, T., Zheng, J., & Harland, C. (2000). An initial classification of supply networks. *International Journal of Operations & Production Management, 20*(6), 675-691.

Lamming, R., Phillips, W., & Caldwell, N. (2001). Value Transparency in Supply Relationship: An Innovation Systems Approach. In *16th Annual IMP Conference, Oslo, Norway*.

Langat, R. K., & Nyang'au, S. P., (2020). Project Management Processes and the Implementation of Geothermal Power Project in Nakuru County Kenya. *The Strategic Journal of Business & Change Management, 7(3), 299-326.*

Lee, H. (2004). The Triple-A Supply Chain. *Havard Business Review, 82*(10), 102-113.

Lee, H. (2006). *The triple-A supply chain. Harvard Business Review on SCM.* New York: Havard Business School Press.

Lee, H. L., & Billington, C. (1992). Managing supply chain inventory: pitfalls and opportunities. *Sloan management review, 33*(3), 65-73.

Lee, H. L., & Billington, C. (1993). Material management in decentralized supply chains. *Operations research, 41*(5), 835-847.

Lemghari, R., Okar, C., & Sarsri, D. (2018). Supply chain performance measurement: A case study about applicability of score model in automotive industry firm. In *MATEC Web of Conferences* (Vol. 200, p. 00016). EDP Sciences.

Lewis, L. (2000). CPFR Solutions. *Progressive Grocer, 79*(4), 28-32.

Li, G., Lin, Y., Wang, S., & Yan, H. (2006). Enhancing agility by timely sharing of supply information. Supply Chain Management. *An International Journal, 11*(5), 425-435.

Li, L. (2007). *Supply chain management: concepts, techniques and practices enhancing the value through collaboration*. Singapore. World Scientific Publishing Co. Pte Ltd.

Li, L., Su, Q., & Chen, X. (2011). Ensuring supply chain quality performance through applying the SCOR model. *International Journal of Production Research*, *49*(1), 33-57.

Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, *34*(2), 107-124.

Lima-Junior, F. R., & Carpinetti, L. C. R. (2019). Predicting supply chain performance based on SCOR® metrics and multilayer perceptron neural networks. *International Journal of Production Economics*, *212*, 19-38.

Liu, Y., Liu, Z. Y., Ren, W. W., & Forrest, J. Y. L. (2020). A coordination mechanism through relational contract in a two-echelon supply chain. *Journal of Retailing and Consumer Services*, *56*, 102156.

Lukić, J., Radenković, M., Despotović-Zrakić, M., Labus, A. & Bogdanović, Z. (2015). Supply chain intelligence for electricity markets: A smart grid perspective. *Information Systems Frontiers, 19(1), 91-107.*

Lummus, R., Duclos, L., & Vokurka, R. (2003). Supply Chain Flexibility: Building a New Model. *Global Journal of Flexible Systems Management, 13*(4), 1-13.

Lummus, R., Vokurka, R., & Alber, K. (1998). Strategic supply chain planning. *Production and Inventory Management Journal, 39*(3), 49-58.

Lysons, B., & Farington, B. (2006). *Purchasing and supply chain management.* Harlow Essex: Prentice Hall.

Lysons, K., & Farrington, B. (2012). *Purchasing and Supply Chain Management* (8th ed.). Pearson Harlow.

Macchiavello, R. (2022). Relational contracts and development. *Annual Review of Economics, 14*, 337-362.

Macneil, I. R. (1987). Relational contract theory as sociology: A reply to professors Lindenberg and de Vos. *Journal of Institutional and Theoretical Economics (JITE)/Zeitschrift für die gesamte Staatswissenschaft*, *143*(2), 272-290.

Magutu, P. O., Mbeche, I. M., Njihia, J. M., & Nyaoga, R. B. (2016). The relationship between supply chain strategies and supply chain performance among large-scale manufacturing firms: the moderating effect of supply chain technology. *EuroMed Journal of Management*, *1*(2), 123-148.

Maiyo, P. (2009). Irregularities in undertaking procurement practices in public institutions. *Journal of purchasing*, *22*, 465-480.

Manrodt, K., Abott, J., & Vitasek, K. (2008). Lean practices in the supply chain. *Lean Practices in Marketing Management 112, 34*(2), 115-121.

Manyathi, S. (2019). The Influence of Procurement Practices on Service Delivery Relationships in South Africa. *Asian Journal of Social Sciences and Management Studies 4*(1), 10-19.

Martz, W. (2013). Evaluating organizational performance: Rational natural and open systems models. *American Journal of Evaluation, 3*(4), 385-401.

Mattson, L. (2002). Dynamics of markets. How actors - network theory and markets as networks can learn from each other. *Nordic workshop on international studies.* kolding.

Matunga, D. A. (2023). *Procurement Practices and Level of Implementation of Public Procurement Regulations in the Devolved Systems of Government in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Matuerandu, M., & Iravo, M. (2014). Impact of supply chain management practices on organization performance: A case of Haco Industries Limited Kenya. *IOSR Journal of Business and Management, 16*(4), 62-64.

Mbanje, s., & Lunga, J. (Eds.). (2015). *Fundamental principles of supply chain management.* Van Schaik.

McLaughlin, J., McLaughlin, J., & Elaydi, R. (2014). Ian Macneil and relational contract theory: evidence of impact. *Journal of Management History, 20*(1), 44-61.

Mensah, C., Diyuoh, D., & Oppong, D. (2014). Assessment of supply chain management practices and its effect on the performance of Kasapreko company limited in Ghana. *European journal of logistics and purchasing and supply chain management, 2*(1), 1-16.

Mentzer, J. T., & Moon, M. A. (2012). *Sales Forecasting Management: A Demand Management Approach* (2nd ed). Sage inc.

Mentzer, J., Min, S., & Zacharia, Z. (2012). The nature of inter-firm partnering in supply chain management. *Journal of Retailing, 76*(4), 549-568.

Mentzer, J., William, D., James, S. K., Soonhong, M., Nancy, W. N., Carlo, D. S., & Zach, G. Z. (2001). Defining Supply Chain Management. *Journal of Business Logistics, 22*(2), 18-25.

Min, S., & Mentzer, J. (2004). Developing and measuring Supply Chain concepts. *Journal of Business Logistics, 25*(1), 63-95.

Minjire, E., & Waiganjo, E. (2015). Factors Affecting the Performance of Public-Private Partnerships in Healthcare Projects in Kenya: A Case Study of the Ministry of Health, Nairobi. *Strategic Journal of Business and Change Management, 2*(36), 717-746.

Moberg, C., Cutler, B., Gross, A., & Speh, T. (2002). Identifying antecedents of information exchange within supply chains. *International Journal of Physical Distribution and Logistics Management, 32*(9), 755-770.

Mogaka, C. O. (2023). *Supply Chain Integration and the Competitive Advantage of Food and Beverage Manufacturing Firms in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Moharamkhani, A., Bozorgi-Amiri, A., & Mina, H. (2017). Supply chain performance measurement using SCOR model based on interval-valued fuzzy TOPSIS. *International Journal of Logistics Systems and Management, 27*(1), 115-132.

Mohdzain, N. B., White, A. D., & Ward, J. M. (2012). Co-Evolution of Supply Strategies and Technologies. *Journal of Enterprise Resource Planning Studies, 2012.*

Monczka, R. M., Handfield, R. B., Giunipero, L. C., & Patterson, J. L. (2015). *Purchasing and Supply Chain Management.* Boston: Cengage Learning Emea.

Mortgomery, D., Peck, E., & Vinning, G. (2001). *Introduction to linear regression analysis* (3rd ed.). New York: John Wiley.

Mouzas, S., & Blois, K. (2008). Relational contract theory: confirmations and contradictions. In *the Proceedings of 24th IMP Conference* (pp. 1-18).

Muge, P. (2009). procurement practices in public institutions in Kenya. *supply chain management journal, 22*.

Mugenda, O. M., & Mugenda, A. (2003). *Research Methods: Quantitative and Qualitative Approaches.* Nairobi: Acts Press.

Murage, J. (2011). *Commercial electricity supply chain management practices in Kenya. Doctoral dissertation.* University of Nairobi.

Mutembete I. W., & Yusuf, M. (2020). Risk Management Practices and Implementation of Last Mile Connectivity Project in Machakos County. *The Strategic Journal of Business & Change, 7(4), 282-293*

Mutindi, V., Namusonge, G., & Obwogi, J. (2013). Effects of Strategic Management Drivers on Organizational Performance: A Survey of the Hotel Industry in Kenyan Coast. *International Journal of Arts and Commerce, 2*(11), 83-105.

Mutua, J., Waiganjo, E., & Oteyo, I. (2014). The influence of contract management on performance of outsourced projects in medium manufacturing enterprises in Nairobi County, Kenya. I*nternational Journal of Business and Social Science,5*(1).

Mwale, H. (2012). *Supply Chain Management practices and organization performance of large manufacturing companies in Nairobi, Kenya.* Unpublished Thesis, Nairobi.

Najafi, N. (2013). Supply network development: A case of developing a supply base in China. *The IMP Journal, 1*, 59-90.

Namusonge, E., Mukulu, E., & Iravo, M. (2017). Influence of supply chain capabilities on performance of manufacturing entities in Kenya. *International Journal of Academic research in Business and Social Sciences, 7(2), 2222-6990.*

Namusonge, G., Nteere, K., & Mukulu, E. (2012). Pedagogical approaches determining the performance of entrepreneurship education in Kenya public

universities. *International Journal of Humanities and Social Sciences,* 238-246.

Namusonge. (2010). *Business Statistics: Concepts and Applications.* Beau Bassin, Mauritius: VDM.

Namutali, W., & Mwangangi, P. W. (2019). Influence of supply chain practices on performance of large manufacturing firms in Kenya. *The Strategic Journal of Business & Change Management, 6(4), 512 – 526.*

National Audit Office. (2014). *Transforming Contract Management*. Retrieved from https://www.nao.org.uk.../Home-office- Ministry-of Justice-transforming contract

Naylor, B., Naim, M., & Berry, D. (1999). Leagility: Integrating the lean and agile manufacturing paradigms in the total supply chain. *International Journal of Production Economics, 62*(1), 107-118.

Ngumbi, K., Elizabeth, & Ombajo, M. (2015). Qualitative Interviews. *Scholars Journal of Nigerian city of Uyo. Journal of Human Ecology, 36*(3), 229-235.

Nguyen, T. T. H., Bekrar, A., Le, T. M., & Abed, M. (2021, May). Supply chain performance measurement using SCOR model: a case study of the coffee supply chain in Vietnam. In *2021 1st International Conference On Cyber Management and Engineering (CyMaEn)* (1-7). IEEE.

Njau, N. (2010). *Investigation on the Impact of Value Chain Management Strategy on Performance. A Study of major oil Companies in Kenya.* Unpublished MBA Project, University of Nairobi, Nairobi.

Njeru, S. E. (2015). *Factors affecting effective implementation of Procurement Practices in tertiary public training institutions in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Njeru, S., Ngugi, P., Arasa, R., & Kahiri, J. (2014). Procurement policies and implementation of effective procurement practices in tertiary public institutionsin Kenya. *Global Advanced Research Journal of Management and Business Studies, 3*(4), 166-170.

Nkunda, R. M., Kazungu, I., & Changlima, I. A. (2023). Collaborative Procurement Practices in Public Organizations: A Review of Forms, Benefits and Challenges. *Ghana Journal of Development Studies 20*(1), 40-57

Noble, D. (1997). Purchasing and supplier management as a future competitive edge. *Logistics Focus, 5*(5), 23-27.

Novack, R. A., & Simco, S. W. (1991). The industrial procurement process: a supply chain perspective. *Journal of business logistics*, *12*(1), 145.

Ntabe, E. N., LeBel, L., Munson, A. D., & Santa-Eulalia, L. A. (2015). A systematic literature review of the supply chain operations reference (SCOR) model application with special attention to environmental issues. *International Journal of Production Economics*, *169*, 310-332.

Nwajei, U. O. K. (2021). How relational contract theory influence management strategies and project outcomes: A systematic literature review. *Construction Management and Economics*, *39*(5), 432-457.

O'Donoghue, T., & Punch, K. (2003). *Qualitative educational research in action: Doing and reflecting.* Routledge.

Oliver, C. (1990). Determinants of inter-organizational relationships: integration and future directions. *Academy of Management Review*, *15*(2), 241-265.

Oluka, N. P., & Basheka, C. B. (2014). Determinants and constraints to effective procurement in Uganda: A practitioners' perspective. *International journal of logistics systems and management*, *17*(1), 104-124.

Omondi, P., Ombui, K., & Mungatu, J. (2013). Factors affecting effective strategy implementation for attainment of millennium development goal 5 by international reproductive health non-governmental organizations. *The TQM Journal, 25*(5), 507-519.

Onuonga, S. (2012). The Relationship between commercial energy consumption and Gross Domestic Income in Kenya. *The Journal of developing Areas, 46(1), 305-314.*

Onyango, C., Njeru, G., & Omori, B. (2009). Regulatory and Competition-related reforms in Kenya's Power and Petroleum Sectors. *Organizations and Society, 20*, 93-109.

Otchere, A., Annan, J., & Anin, E. (2013). Achieving competitive advantage through supply chain integration in the cocoa industry: case of Olam Ghana limited and produce buying company limited. *International journal of business and social sciences research, 3*(2), 131-145.

Parker, D., & Mobey, A. (2004). Action research to explore perceptions of risk in project management. *International Journal of Productivity and Performance Management, 53*(1), 18-32.

Paul, S. (2011). Procurement policies in public corporations. *Journal of Purchasing*, *8*(1), 17-35.

Peck, H. (2006). Drivers of supply chain vulnerability: An integrated framework. *International Journal of Physical Distribution and Logistics management, 35*(4), 210-232.

Pelka, P., & Dudek, G. (2018). Neuro-fuzzy system for medium-term electric energy Demand forecasting. *In 38th International Conference on Information Systems Architecture and Technology (ISAT)* 655, 38–47.

Pelka, P., & Dudek, G. (2019). Medium-term electric energy demand forecasting using Generalized regression neural network. *In 39th International Conference on Information Systems Architecture and Technology (ISAT)* 853, 218–227.

Perera, S., Rameezdeen, R., Chileshe, N., & Hossseini, M. (2014). Enhancing the effectiveness of risk management practices in Sri Lankan road construction projects: A Delphi approach. *international journal of construction management, 1*(14), 1-14.

Petrik, D., Maina, G., Muriuki, M., & Munyoki, J. (2020). National Energy Situational and Stakeholder Analysis: Kenya. *International Journal of Innovation and Economic Development, 6*(5), 71-77.

Petrovic, R. & Arsovski, Z. (2019). *Business Processes Mapping for Improving E-Supply Chain Performance.* University of Kragujevac, Faculty of Economics, Kreagujevac, Serbia.

Pettit, T., Fiskel, J., & Croxton, K. (2013). Ensuring supply chain resilience: Development and implementation of an assessment. *Journal of business logistics, 34*(1), 46-76.

Pochard, S. (2003). *Managing risks of supply chain disruptions: Dual sourcing as a real option.* Doctoral Dissertation. Retrieved from www.mit.ed/dissertations

Ponomarov, S. (2012). *Antecedents and consequences of supply chain resilience: A dynamic capabilities perspective.* Tennessee: University of Tennessee. Retrieved from www.trace.tennessee.edu/utk

Ponomarov, S., & Holcomb, M. (2009). Understanding the concept of supply chain resilience. *The International Journal of Logistics Management, 20*(1), 124-143.

Porter, M. (1985). *Competitive advantage: creating and sustaining superior performance.* New York: Free Press.

Power, D., Sohal, A., & Rahman, S. (2001). Critical success factors in agile supply chain management: An empirical study. *International Journal of Physical Distribution and Logistics Management, 31*(4), 247-265.

Power, D. (2005). Supply chain management integration and implementation: a literature review. *Supply chain management: an International journal*, *10*(4), 252-263.

Prasetyaningsih, E., Muhamad, C. R., & Amolina, S. (2020, April). Assessing of supply chain performance by adopting Supply Chain Operation Reference (SCOR) model. In *IOP Conference Series: Materials Science and Engineering* (Vol. 830, No. 3, p. 032083). IOP Publishing.

Pulles, N., Veldman, J., & Schiele, H. (2014). Identifying innovative suppliers in business networks: An empirical study. Industrial Marketing Management. Purchasing competence. *Production and Operations Management*, *10*(1), 1-15.

Rao, S. (2002). Making enterprises Internet ready: E-business for process Industries. *Work Study, 51*(4), 248-253.

Reiner, G., & Fichtinger, J. (2009). Demand forecasting for supply processes in consideration of pricing and market information. *International Journal of Production Economics, 118*(1), 55-62.

Rezaei, M., Akbarpour Shirazi, M., & Karimi, B. (2018). A multi-objective SCOR-based decision alignment for supply chain performance management. *Scientia Iranica*, *25*(5), 2807-2823.

Richardson, J. (1993). Parallel sourcing and supplier performance in the Japanese automobile industry. *Strategic management journal*, *14*(5), 339-350.

Rodríguez Mañay, L. O., Guaita-Pradas, I., & Marques-Perez, I. (2022). Measuring the supply chain performance of the floricultural sector using the SCOR model and a multicriteria decision-making method. *Horticulture*, *8*(2), 168.

Salvi, V. Z. (2020). Electricity Supply Chain Management – A Literature Review. *Archives of Business Research, 8(1), 182-191.*

Sanderson, J. (1999). Passing value to customers on the power of regulation in the industrial electricity supply chain, supply chain management. *An International Journal, 4*(4), 199-208.

Saunders, M., Lewis, P., & Thornhill, A. (2012). *Research methods for business students.* New York: Prentice Hall.

Schachtman, N. (2000). Trading Partners Collaborate to Increase Sales. *Information Week, 807,* 182-188.

Schneider, L., & Wallenburg, C. (2013). 50 Years of research on organizing the purchasing function: Do we need any more? *Journal of Purchasing and Supply Management, 19*(3), 144-164.

Schneller, E., Stewart, Burns, L., Robert & Smeltzer, L. R. (2006). *Strategic Management of the Health Care Supply Chain.* San Francisco (Cal.) Jossey – Bass

Sellitto, M. A., Pereira, G. M., Borchardt, M., Da Silva, R. I., & Viegas, C. V. (2015). A SCOR-based model for supply chain performance measurement: application in the footwear industry. *International Journal of Production Research, 53*(16), 4917-4926.

Seroney, Wanyoike, & Langat. (2019). Influence of demand forecasting on supply chain performance of petroleum marketing companies in Nakuru County, Kenya. *The international journal of business management and technology,III* (5), 168-176.

Sheffi, Y. (2005). *The resilient enterprise: Overcoming vulnerability for competitive advantage.* Cambridge, MA: MIT Press.

Sheffie, Y. (2006). Resilience reduces risk. *Logistics Quarterly, 12*(4), 12-14. Retrieved from www.logisticsquarterly.com/issues/12-1/LQ_12-1.pdf

Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2009). *Designing and Managing the Supply Chain: Concepts, strategies and cases.* New York: McGraw Hill.

Simiyu, A. N. (2012). *Performance contract as a tool for improving performance in local authorities in Kenya* (Doctoral dissertation, JKUAT-COHRED).

Skjøtt-Larsen, T., Schary, P., Mikkola, J., & Kotzab, H. (2007). *Managing the Global Supply Chain.* Copenhagen: Copenhagen Business School Press DK.

Sorensen, L. (2005). How risk and uncertainty is used in supply chain management: A literature study. *International Journal of Integrated Supply Management, 1*(4), 387-409.

Srivastava, S. (2007). Green supply chain management: A state of the art literature review. *International Journal of Management Reviews, 9*(1), 53-80.

Sukati, I., Hamid, A., Baharun, R., Tat, H., & Said, F. (2002). An investigation of the relationship between Supply Chain Management Practices and Competitive advantage of the firm. *Contemporary Marketing Review, 1*(4), 1-13.

Talluri, W. (2008). Benchmarking the Performance of English Universities. *Benchmarking International Journal, 14*(1), 102-122.

Tan, K. (2002). Supply Chain Management Practices, Concerns and Performance Issues. *Journal of supply chain management, 38*(4), 42-53.

Tan, K., Kanna, V., & Handfield. (1998). Supply Chain Management: supplier performance and firm performance. *International Journal of Purchasing and Materials Management, 34*(3), 2-9.

Toke, L., Gupta, R., & Dandekar, M. (2010). Proceedings of the 2010 International Conference on Industrial Engineering and Operations Management. *Green*

Supply Chain Management; Critical Research and Practices. Dhaka: Bangladesh.

Tomlin, B. (2006). On the value of mitigation and contingency strategies for managing supply chain disruption risks. *Management science, 52*(5), 639-657.

Tomlin, B. (2009). Impact of supply learning when suppliers are unreliable. *Manufacturing and Service Operations Management, 11*(2), 192-209.

Tortorella, G., Miorando, R. and Marodin, G. (2017). Lean supply chain management: Empirical research on practices, contexts and performance. *International Journal of Production Economics, 193, 98-112*

Towill, D., & McCullen, P. (1999). The impact of agile manufacturing on supply chain dynamics. *International Journal of Logistics Management, 10*(1), 83-96.

Tunca, T. I., & Zenios, S. A. (2006). Supply auctions and relational contracts for procurement. *Manufacturing & Service Operations Management*, *8*(1), 43-67.

Uzel, J. (2012). The effect of strategic value-based management on the performance of organizations in Coast Province, Kenya. *International Journal of Business & Social Science, 3*(16), 262-270.

Van Weele, A. (2001). *Purchasing and Supply Chain Management: Analysis, Planning and Practice* (3rd ed.). London: Cengage.

Victor, D., & Heller, T. (. (2007). *The political economy of power sector reform: the experiences of five major developing countries.* Cambridge University Press.

Victoria, M., Nyamwange, O., & Harley, M. (2015). Sustainable Supply Chain Management Practices and Performance of United Nations Agencies in Nairobi, Kenya. *Operations Research Society of Eastern Africa, 5*(2), 1-37.

Wagnar, S., & Neshat, N. (2012). A comparison of supply chain vulnerability indices for different categories of firms. *International journal of production research, 50*(11), 1-15.

Wajitunge, W. (2016). The role of supply chain management practices in achieving organizational performance through competitive advantage in Sri Lankan SMES. *Proceedings of 54th ISERD International conference Singapore.*

Wallenburg, C. M., & Schäffler, T. (2014). The interplay of relational governance and formal control in horizontal alliances: A social contract perspective. *Journal of Supply Chain Management, 50*(2), 41-58.

Wang, X., & Disney, M. (2016). The bullwhip effect: Progress, trends and directions. *European Journal of Operational Research, 250*(3), 691-701.

Wangari, I. (2014). *The Impact of Kenya's Electricity Sector Reforms. Empirical evidence on the impact on sector performance.* Unpublished PhD Thesis Nairobi: University of Nairobi.

Wanyiri, N. (2010). *An assessment of the Total Quality Management Practices in the Thermal Power Plants in Kenya.* Unpublished MBA Project, University of Nairobi.

Waters, D. (2007). *Supply chain risk management: Vulnerability and resilience in logistics.* London: Kogan Page Limited.

Watiri, L., & Kihara, A. (2017). Influence of supply chain management practices on competitive advantage in cement manufacturing industry: A case of East African Portland cement company limited. *the strategic journal of business andchange management, 4*(27), 461-481.

Wibowo, M. A., & Sholeh, M. N. (2017). Application of supply chain performance measurement in score model at building project. *IPTEK Journal of Proceedings Series*, *3*(1), 60-64.

Williams, J., & Ghanadan, R. (2006). Electricity reform in developing and transition countries. *A Reappraisal Energy, 31*(6), 815-844.

Wisegeek. (2013). Retrieved from www.wisegeek.com.

Wisner, J., Leong, G., & Tan, K. (2010). *Principles of Supply Chain Management – A Balanced Approach* (3rd ed.). Thomson, USA: South-Western Publishing.

Womack, J., & Jones, D. (2003). *Lean Thinking* (2nd ed.). London: Free Press Business.

World Bank. (2010). *Africa Infrastructure Country Diagnostic.* Washington DC: World Bank. Retrieved from Kenya's Infrastructure: A Continental Perspective.

Yan, R.L. & Wang, K.Y. (2012). Franchisor–franchisee supply chain cooperation: sharing of demand forecast information in high-tech industries. *Industrial Marketing Management, 41(7), 1164-1173.*

Yang, B., & Yang, Y. (2012). Postponement in supply chain risk management: A complexity perspective. *International Journal of Production, 48*(7), 1901-1912.

Yang, X., Wang, Z., Chen, Yand, F., & Yuan, F. (2010). Factors Affecting Firm Level Investment and Performance in Border Economic Zones between the People's Republic of China and its Neighboring GMS Countries. *Journal of Greater Mekong Sub Region Development Studies, 5*, 1-32.

Yaseen, S., Naas, F., & Michael., T.D. (2023). The relevance of Educational Qualifications to Job Performance among Academic Administrators at a University. *International Journal of Higher Education 12(1), 20-38.*

Yu, H., Zeng, A. Z., & Zhao, L. (2009). Single or dual sourcing: decision-making in the presence of supply chain disruption risks. *Omega*, *37*(4), 788-800.

Yusuf, Y., Sarhadi, M., & Gunasekaran, A. (1999). Agile manufacturing: The drivers, concepts and attributes. *International Journal of Production Economics, 62*(1), 33-43.

Zeng, W., Tse, M., & Tang, M. (2018). Supply Chain Quality Management: An Investigation in the Chinese Construction Industry. *International journal of Engineering Business Management, 10*

Zheng J. W. (2017). *Supply Chain Management for Collection Services of Academic Libraries. Solving Operational Challenges and Enhancing User Productivity.* Indiana. Elsevier Ltd.

Zikmund, W. (2003). *Business Research Methods* (7th ed.). India: New Delhi.

Zsidisin, G. (2001). Environmental purchasing: A framework for theory development. *European Journal of Purchasing & Supply Management, 7*(1), 61-73.

Zuzana, M. (2012). Knowledge of the Firm Combinative Capabilities and Replication Technology. *Organization Science, 22*.

APPENDICES

Appendix 1: Letter of Introduction

Dear Respondents,

I am currently enrolled as a doctoral student at Jomo Kenyatta University of Agriculture and Technology (JKUAT), pursuing a Doctor of Philosophy degree in Supply Chain Management. My research focuses on investigating the relationship between supply chain management practices and firm performance within the energy sector in Kenya, specifically examining the electricity energy sub-sector. This study employs a survey methodology to gather relevant data and insights. I kindly request your aid in completing the enclosed questionnaire. The purpose of this research endeavour is to fulfil the stipulations set out by my doctoral program. Please provide genuine and honest responses to the questions in the questionnaire. Please carefully review the provided text and respond to the questions by selecting the appropriate answer. Please offer concise responses in the designated area, if necessary. All information provided was only utilized for academic purposes and handled with the highest level of confidentiality. We express our gratitude in advance for your participation in this research endeavour.

Yours Faithfully,

Catherine Munyi Wanja

Appendix 2: Questionnaire

SECTION A: GENERAL INFORMATION

Instruction: Please read each statement carefully and put a tick or ticks (√) where appropriate to you in the options provided or you fill the blanks where necessary.

1. Including this year, indicate the range of years you have worked in the Department:
   - 1 – 5 [ ]
   - 6 – 10 [ ]
   - 11 – 15 [ ]
   - 16 – 20 [ ]
   - 21 and above [ ]
2. Please tick where appropriate Level of education
   - Secondary [ ]
   - Diploma [ ]
   - Undergraduate [ ]
   - Masters [ ]
   - Professional certificate [ ]

SECTION B: DEMAND FORECASTING PRACTICE

3. Indicate the level of agreement with following statements in regard to influence of demand forecasting practice on the Performance of firms in electricity energy sub-sector chain in Kenya using the scale 1 to 5 in the table where: (5. Strongly Agree 4. Agree 3. Neutral 2. Disagree 1. Strongly Disagree)

Indicate the level of agreement with following statements regarding influence of demand forecasting practice on the Performance of firms in electricity energy sub-sector	**1**	**2**	**3**	**4**	**5**
Consumption data rate is shared throughout by the firms in the electricity energy sub-sector					
There is sharing of information among the trade partners					
Organizations communication systems are closely integrated for effective sharing of forecast information					
Firms' collaboration with supply chain partners create a more accurate Forecast					
Firms scan operating environment in order to conduct accurate forecasting					

4. Indicate in your own perspective how demand forecasting practice influence the performance of firms in electricity energy sub-sector in Kenya
   ……
   ……
   ……
   ……

SECTION C: STRATEGIC SOURCING PRACTICE

5. Which of the following sourcing strategy (ies) has your organization been using in the past 5 years up to 2017 to acquire its materials? Indicate in the space provided with a tick (√)
   (i) Single sourcing- a sourcing strategy where a buying firm has only one source of supply for a specific product or service [ ]
   (ii) Multiple sourcing - sourcing strategy where a buying firm has multiple source of supply for a particular product or service. [ ]
   (iii) Dual sourcing – a sourcing strategy where a buying firm splits the volume of a single item between two similar suppliers to reduce risk [ ]
   (iv) Others [ ]
   Kindly specify
   ……
   ……
   ……
   ……

6. Show your level of agreement with following statements on how strategic sourcing influence Performance of firms in electricity energy sub-sector in Kenya using the scale 1 to 5 in the table where: (5. Strongly Agree 4. Agree 3. Neutral 2. Disagree 1. Strongly Disagree)

Indicate the level of agreement with following statements regarding influence of strategic sourcing practice on the Performance of firms in electricity energy sub-sector	**1**	**2**	**3**	**4**	**5**
The sourcing decisions of one organization along the electricity energy sub-sector supply chain impact other organization's processes					
Buying a wrong item/service or buying from a wrong supplier can have a major impact on product or service offerings					
Strategic sourcing optimizes the organizations supply base					
Strategic sourcing incorporates the customers' needs such as on time delivery					
Sourcing decisions are based on set guidelines					
Different approaches are used in negotiations with suppliers					

7. Indicate in your own perspective how strategic sourcing influence the performance of firms in electricity energy sub-sector in Kenya……
   ……
   ……
   ……
   ……
   ……
   …….

SECTION D: SUPPLY CHAIN RISKS MANAGEMENT PRACTICE

8. Which are some of the unexpected outcomes experienced by the organization during its operation? Indicate in the space provided with a tick (√)
   (i) Changes in time scheduled for activities [ ]
   (ii) Changes in planned resources [ ]
   (iii) Demand changes [ ]
   (iv) Policy changes [ ]
   (v) Others (please specify) ……
   ……
   ……
   ……
9. Show your level of agreement with following statements on influence of supply chain risk management practice on the Performance of firms in electricity energy sub-sector in Kenya using the scale 1 to 5 in the table where: (5. Strongly Agree 4. Agree 3. Undecided 2. Disagree 1. Strongly Disagree)

Indicate the level of agreement with following statements regarding influence of supply chain risk management practice on the Performance of firms in electricity energy sub-sector	**1**	**2**	**3**	**4**	**5**
Organization have different strategies such as alliances, use of e- procurement, integrating supply chains and collaborations to manage risks.					
Supply chain risks can cause significant detrimental effects on supply chain such as disruptions in production and cancellation of clients' orders					
The organization carries out assessment of risks regularly within electricity energy sub-sector supply chain					
The organization stakeholders are regularly trained on risk management					
Organizations within electricity energy sub-sector supply chain share risk information with partners.					

10. Indicate in your own perspective how risk management influence the performance of electricity energy sub-sector in Kenya……
    ……
    ……
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    ……
    ……

SECTION E: CONTRACT MANAGEMENENT

11. Indicate the level of agreement with following statements regarding influence of contract management on the Performance of firms in electricity energy sub-sector in Kenya using the scale 1 to 5 in the table where: (5. Strongly Agree 4. Agree 3. Neutral 2. Disagree 1. Strongly Disagree)

Indicate the level of agreement with following statements regarding influence of contract management practice on the Performance of firms in electricity energy sub-sector	**1**	**2**	**3**	**4**	**5**
Contract management team is in place which helps in ensuring materials and services delivered meet the required standards					
Actors along the chain have efficient and secure sources for collecting and analyzing customers' complaints and providing the feedback					
There are explicit standards and measures of performance between different stakeholders in electricity energy sub-sector					
Contract management minimizes the rate of power outages and losses					
Monitoring of the service providers' performance against the output specification is undertaken to ensure the financial implications of any failure to perform has been taken into account.					
Contract administration ensures that obligations and responsibilities defined under the contract are met.					

12. There is potential to define a good contract in terms of outputs, as demonstrated by comparable projects. What are the quality problems mostly faced during the operations? Indicate in the space provided with a tick (√)
    a) Inadequate skills and capacity [ ]
    b) Quality of materials [ ]

SECTION F: PROCUREMENT REGULATIONS COMPLIANCE

13. Indicate the level of agreement with following statements regarding the effect of procurement regulations compliance on the performance of firms in electricity energy sub-sector in Kenya using the scale 1 to 5 in the table where: (5. Strongly Agree 4. Agree 3. Neutral 2. Disagree 1. Strongly Disagree)

Indicate the level of agreement with the following statements regarding the influence of procurement regulations compliance on the performance of firms in electricity energy sub-sector in Kenya	**1**	**2**	**3**	**4**	**5**
Procurement regulations compliance ensures accountability in demand forecasting					
Procurement regulations compliance ensures transparency in sourcing					
Procurement regulations compliance enables transparency in contract management					
Procurement regulations compliance enables effective management of supply chain risks					

SECTION G: PERFORMANCE IN ELECTRICITY ENERGY SUB SECTOR SUPPLY CHAIN

14. Kindly provide the information in the spaces provided in relation to the Performance of firms in electricity energy sub-sector in Kenya for the period 2013- 2017

Revenue indicator	**2013**	**2014**	**2015**	**2016**	**2017**
Fuel costs (US$ millions)					
Energy purchase/extraction costs (US$ millions)					
Revenue from sales (US$ millions)					
Profit before tax (US$ millions)					

15. Show your level of agreement with the following statements on customer satisfaction with the performance of firms in electricity energy sub-sector in Kenya using the scale 1 to 5 in the table where: (5. Strongly Agree 4. Agree 3. Neutral 2. Disagree 1. Strongly Disagree)

Indicate your level of agreement with the following statements on customer satisfaction with the performance of firms in electricity energy sub-sector in Kenya	**1**	**2**	**3**	**4**	**5**
Ordered supplies are delivered on time					
Anticipated delays are communicated on time					
Grievances are sorted out within the shortest time possible					
Feedback from customers is analysed and responded to appropriately					

16. According to your own perspective, what are probable constraints that may affect the performance of electricity energy sub-sector supply chain? Indicate in the space provided.

    ……
    ……
    ……
    ……
    ……

17. What could be the probable solution(s) to the constraints if any? Indicate in the space provided.

    ……
    ……
    ……
    ……
    ……

Thank You.

Appendix 3: Document Analysis Guide

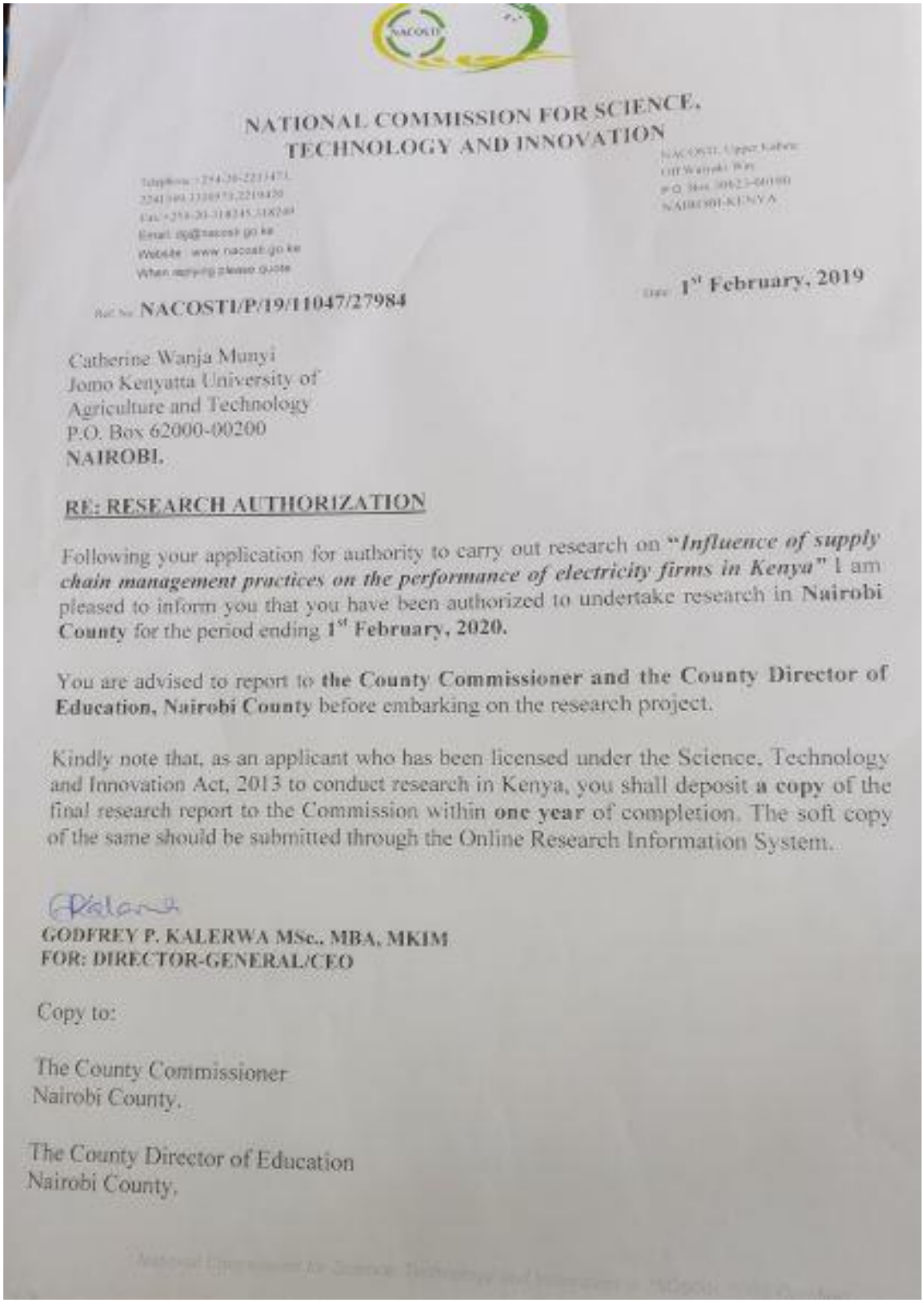
S/No	Variable/Performance Indicator	Statement	Response	
1.	Performance Revenue Generated	Collect data on revenue generated for the period of five years from 2013-2017	2013 2014 2015 2016 2017	
2.	Profit	Collect data on profit earned from financial statements for the period of five years from 2013-2017	2013 2014 2015 2016 2017	
3.	Customer Satisfaction	Collect data on customer satisfaction from customer satisfaction surveys (AVG %) for the five years period from 2013-2017	2013 2014 2015 2016 2017	

Appendix 4: List of Firms dealing with Electricity energy sub-sector in Kenya

S/No	COMPANY	ADDRESS
1	Geothermal Development Company	P.O Box 100746-00101, Nairobi Tel. +254719037000 0202427516
2	Kenya Transmission Company	P.O Box 34942-00100, Nairobi Tel. 0719018000
3	Kenya Power and Lighting Company	P.O Box 30099-00100, Nairobi Tel. 0720221251
4	GulfPower Limited	P.O Box 61872-00200, Nairobi
5	IberAfrica power (E.A) Limited	P.O Box 32443-00600, Nairobi Tel. 254-203655500
6	Rabai Power	P.O Box 34353-80118, Nyari, Mombasa Tel. +254-412013806
7	Tsavo Power Company	P.O Box 10727-00100, NairobiNation Centre 13th floor Kimathi Street, Nairobi Tel. 0722205283
8	OrPower 4 Incorporation	P.O Box 1566-20117, Naivasha Tel.0721337470
9	Lake Turkana Wind Power Limited	P.O Box 2114-00502, Nairobi Kenya Tel 0203865675
10	Triumph Power Generating Limited	P.O Box 11640-00400, Nairobi Tel. +254-20554301
	Mumias Sugar	P.O Box Private Bag, Mumias Tel 0722203891
12	Bidco Oil Refineries Limited	P.O Box 239-01000, Thika Kenya Tel (067)282-1000
13	James Finlay	P.O Box 72244, Nairobi Kenya Tel 0203865675
14	Imenti Tea Factory	P.O Box 1800-60200, Meru Tel 0771337338
15	Kenya Electricity energy sub-sector Generating Company	P.O Box 47936-00100, NairobiTel 254-203666000 Or 254-711036000

Source (EPRA, 2017)

Appendix 5: Research Permit



NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Ref No: NACOSTI/P/19/11047/27984

Date: 1st February, 2019

Catherine Wanja Munyi
Jomo Kenyatta University of
Agriculture and Technology
P.O. Box 62000-00200
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on ***"Influence of supply chain management practices on the performance of electricity firms in Kenya"*** I am pleased to inform you that you have been authorized to undertake research in **Nairobi County** for the period ending **1st February, 2020.**

You are advised to report to **the County Commissioner and the County Director of Education, Nairobi County** before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit **a copy** of the final research report to the Commission within **one year** of completion. The soft copy of the same should be submitted through the Online Research Information System.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioner
Nairobi County.

The County Director of Education
Nairobi County.