INFLUENCE OF CONTEMPORARY SUPPLY CHAIN PRACTICES ON PERFORMANCE OF LARGE MANUFACTURING FIRMS IN KENYA

FRANCIS KIARIE MEMIA

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Influence of Contemporary Supply Chain Practices on Performance of Large Manufacturing Firms in Kenya

Francis Kiarie Memia

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DECLARATION

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

Signature……Date……..

Francis Kiarie Memia

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

Signature……Date……..

Dr. Karanja Ngugi, PhD

JKUAT, Kenya

Signature……Date……..

Prof. Romanus Odhiambo, PhD

JKUAT, Kenya

DEDICATION

This research thesis is dedicated to my wife Mrs. Grace Kiarie, my children Joy Kiarie, Ron Kiarie and Peace Kiarie.

Special dedication goes to my mum Esther who worked very hard as a farmer to see that I went to school without her this dream would never have been full filled.

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LIST OF ACYRONYMS AND ABBREVIATIONS

BPO	Business Process Outsourcing
CRM	Customer Relationship Management
CSR	Corporate Social Responsibility
ERP	Enterprise Resource Planning
EPS	Earnings per Share
GSCM	Green Supply Chain Management
HRM	Human Resource Management
ICT	Information Communication Technology
JIT	Just In Time
KAM	Kenya Association of Manufacturers
KIBS	Knowledge-intensive Business Services
KWFT	Kenya Women Finance Trust
LED	Light Emitting Diode
MRP	Materials Resource Planning
NACOSTI	National Comission for Science,Technology and Innovation
OEC	Observatory of Economic Complexity
PMS	Performance Measurement Systems
PPC	Purchasing and Procurement Centre
RBV	Resource-Based View

RFID	Radio Frequency Identification
SC	Supply Chain
SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference
SRM	Supplier Relationship Management
TOC	Theory of Constraints

OPERATIONAL DEFINITION OF TERMS

Agile Supply Chain: It is the use of responsiveness, competency, flexibility, and quickness to manage how well a supply chain entity operates on a daily basis such that the products and services they provide are consumed on time and therefore the organization does not need to store inventory (Salmon, 2014).

Contemporary Supply Chain Practices: - Contemporary supply chain practices entails current operations and activities that are carried out during supply chain management aimed at achieving efficiency, effectiveness, value addition, cost reduction and environmental sustainablility among others (Ross, 2013).

Cost Management: Cost management has been defined as the process of planning and controlling the budget of a business. It is also a form of management accounting that allows a business to predict impending expenditures to help reduce the chance of going over budget (Drury, 2013)

Customer relationship management: – It is defined as the process and manner by which a business develops, establishes, and maintains relationships with its customers (McMurrian & Matulich, 2016).

Energy Conservation: It is a process of engaging in reducing the amount of energy used by decreasing the consumption of water, electricity and other natural sources and making sure energy is used as efficiently as possible by using products that use energy efficiently e.g. LED lighting systems and models of appliances, that have been designed to operate with high

energy efficiency to ensure they use as little power as is needed for the services they provide (Frederiks, Stenner, & Hobman, 2015).

Green Supply Chain: It is defined as a process of delivering services to the customers, production, manufacturing and supply of materials taking into consideration the concern on environment (Fahimnia, Sarkis, & Davarzani, 2015).

Information Technology: Information technology refers to the use of any computers, storage, networking and other physical devices, infrastructure and processes to create, process, store, secure and exchange all forms of electronic data (Rouse, 2015).

Lean Supply Chain: It is defined as the supply chain without any extra processes that does not add value to the supply chain it is important because of the definition it removes the unneeded processes which will reduce production cost (Mangan & Lalwani, 2016).

Manufacturing Firm: This is any business that uses components, parts or raw materials to make a finished good. These finished goods can be sold directly to consumers or to other manufacturing company that use them for making a different product (Christopher, 2016).

Organizational Performance: - Organizational performance refers to the extent to which an organization achieves a set of pre-defined targets that are unique to its mission, vision and goal. These targets will include both objective (numerical) and subjective (judgmental) indicators (Maduenyi, Oke, Fadeyi, & Ajagbe, 2015).

Outsourcing Practices: Outsourcing is a practice used by different companies to reduce costs by transferring portions of work to outside suppliers rather than completing it internally (Kahraman, Oztaysi, & Onar, 2016)

Reverse Logistics: Reverse logistics refers to the process of planning, implementation and efficiently control of the flow of raw materials, in-process inventory, finished goods and related information from the point of consumption to the point of origin with the purpose of recovering the primary value or dispose of them properly (Rubio & Jiménez-Parra, 2017).

Sourcing: Sourcing has been defined as the process of taking advantage of purchasing opportunities by continually reviewing current needs against purchasing opportunities (PPC, 2016).

Supplier Relationship Management: - Supplier relationship management is a comprehensive approach to managing an enterprise's interactions with the organizations that supply the goods and services it uses (Monczka, Handfield, Giunipero, & Patterson, 2015).

Supply Chain (SC): Supply chain (SC) entails all the activities that are associated with the flow of goods and services from the stage of raw materials to the final product usable by clients (Munoz, Capon-Garcia & Puigjaner, 2013)

Supply Chain Collaboration: It is has been defined as a way in which companies collaborate across the supply chain in order to enjoy reductions in inventories and costs, together with improvements in speed, service levels, and customer satisfaction (Soosay & Hyland, 2015).

Supply Chain Management: Supply chain management (SCM) is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumers (Christopher, 2016).

Waste Management: It is defined as all the activities and actions required to manage waste from its inception to its final disposal which include collection, transportation, disposal, recycling and monitoring of wastes (Chand & Isla, 2015).

ABSTRACT

The study sought to determine the influence of contemporary supply chain practices on performance of large manufacturing firms in Kenya. The specific objectives were to determine the influence of green supply chain practices on performance of the large manufacturing firms in Kenya, to assess the influence of supplier relationship practices on performance of the large manufacturing firms in Kenya, to establish the influence of customer relationship management practices on performance of the large manufacturing firms in Kenya, to examine the influence of outsourcing practices on performance of the large manufacturing firms in Kenya, to evaluate the influence of lean supply chain practices on performance of the large manufacturing firms in Kenya and to establish the moderating effect of information technology on contemporary supply chain practices on performance of the large manufacturing firms in Kenya. The study adopted five theories; theory of supply chain constraints, resource based view theory, value chain theory, theory of lean six sigma and transaction cost theory. The study used a descriptive research design. The target population for the study was the key staff in supply chain, operations and finance or equivalent managers in the 563 large manufacturing organizations listed by KAM. The sampling technique was stratified random sampling based on the 14 sectors as identified by KAM. Using Yamane formula, the study sampled 312 respondents. The data collection instrument was a structured questionnaire. To accomplish the six objectives of this study, six hypotheses were developed and tested. Data analysis was done using descriptive statistics and inferential statistics. The statistical tests were also done in the study. Presentation of data was in form of charts and tables as deemed appropriate. The study found out that all contemporary supply chain practices had a positive significant influence on performance. The study found a coefficient of determination value of 0.584 signifying that all contemporary supply chain practices contributed to 58.4% in performance of manufacturing firms in Kenya with information technology as a moderating variable. In addition, technology was found to be an important moderating variable between contemporary supply chain practices and performance as there was a general increase in Beta values across all the contemporary supply chain practices. The study therefore concluded that contemporary supply chain practices; green supply chain, customer relationship management, supplier relationship management, outsourcing and lean supply chain when properly implemented led to higher performance of the large manufacturing firms in Kenya. The study recommended that an argumentation of contemporary supply chain practices and information technology systems was necessary as a way of leveraging on the output in organizations.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The study sought to determine the influence of contemporary supply chain practices on organizational performance in large manufacturing firms in Kenya. The background of the study was organized into background, large manufacturing firms, organizational performance and contemporary supply chain practices, problem statement, objectives of the study and research hypothesis. The chapter also presented the significance of the study, the study scope and limitations encountered. The background of the study was done using the funnel approach entailing the global, African and the Kenyan perspectives.

Supply chain management (SCM) for the last decade has been a hot topic drawing discussions from scholars all over the globe. Since then, a number of scholars have gone ahead to attempt to determine the relationship that exists between contemporary supply chain practices and organizational performance, operational and supply chain performance (Handfield, Cousins, Lawson, & Petersen, 2015; Dubey, Gunasekaran, & Ali, 2015; Elwan Ibrahim & Ogunyemi, 2012). Contemporary supply chain practices are those current practices and are considered to promote value across organizations. There are many contemporary supply chain practices, however majority have narrowed the practices to green supply chain management (e.g Laosirihongthong, Adebanjo & Choon Tan, 2013; Guerrero, Maas & Hogland, 2013), customer relationship management (e.g. Ulaga & Loveland, 2014), supplier relationship management (e.g. Shukla, 2016; Pal, Gupta & Garg, 2013), outsourcing (e.g. Ramanathan & Gunasekaran, 2014), lean supply chain management (e.g. Salmon, 2014; Chitale & Gupta, 2014) and information technology (e.g. Dutta, Geiger & Lanvin, 2015; Chang, 2016). The implementation of these comtemporary practices has led to efficient and effective performance outcomes (Carr, 2016).

Efficient and effective supply chain management (SCM) practices have become a very important and valuable way for organizations to remain competitive in the market and to improve the organizational performance since competition is no longer between organizations, but among supply chains (Ross, 2013). Its role especially in remaining competitive is essential due to the competition among the organizations which is affected by the SCM. Due to globalization, organizations need to be competitive in both local and global markets hence it is important for the organizations to better their efficiencies inside the organization to improve the entire supply chain (SC). Organizations also need to be effective and efficient than their competitors (Christopher, 2016). Additionally, organizations have to understand the concepts and the practices of SCM for the purpose of achieving competitiveness and increasing profits (Qayyum & Ashraf, 2015).

Organizations realize their performance through achievement of set of pre-defined targets that are unique to its mission, vision and goal. These targets will include both objective (numerical) and subjective (judgmental) indicators (Maduenyi, Oke, Fadeyi, & Ajagbe, 2015). Organization performance can be measured in terms of relevance, effectiveness, efficiency and financial viability (Beske-Janssen, Johnson, & Schaltegger, 2015). Relevance looks at the degree to which the organization's stakeholders think the company is relevant to their needs. Effectiveness is the degree to which the organization is successful in achieving its strategy, mission, and vision. Efficiency on the other hand is how well the organization uses its resources, and financial viability is how viable the organization is both in the short and long term (Epstein & McFarlan, 2011).

The performance of large manufacturing firms in sub-Saharan Africa has been facing a myriad of challenges mainly attributed to lack of robust supply chain management practices resulting in very slow growth in performance of this sector (Czarnitzki, Hanel, & Rosa, 2011). In Kenya, most firms seem to implement few of the supply chain practices such as outsourcing, information technology and lean supply chain leaving out other contemporary supply chain practices which may add value to the performance of

the organizations. For instance, Moenga (2016) argued that organizations appreciate good supply chain management practices, but have not put the same into practice.

1.1.1 Contemporary Supply Chain Practices

The contemporary supply chain practices have been linked to have a significant impact on the performance of organizataions in both the developed and developing world. In the global context, Moynihan and Dai (2011) argued that there are six SCM practice aspects which include supply chain integration, information sharing, supply chain characteristics, customer service management, geographical proximity and Just In Time (JIT) capability. In addition, Huam, Yusoff, Rasli, and Hamid (2011) studied four supply chain practices in large manufacturing firms in Malaysia which included customer relationship management, supplier relationship, ICT and material flow management which they determined to have an impact on performance. Similarly, Gharakhani, Mavi and Hamidi (2012) studied five dimensions of SCM practice whivh included strategic supplier partnership, customer relationship management, information technology, information sharing and supply chain integration in Iranian companies. All the above concur that contemporary supply chain practices have an influence on performance.

The impact of contemporary supply chain practices on organizational performance in the African context is not different from the global context. Mustefa (2014) developed and conceptualized five SCM practice dimensions which include internal lean practices, strategic supplier partnership, information quality sharing and customer relationship management. These practice dimensions were tested to determine whether they had a relationship with operational performance and organizational performance in Awash Tannery in Ethiopia. The study revealed a strong relationship existed between SCM practices, operational performance and organizational performance. The findings indicate that organizations need to emphasize on SCM practices in order to achieve the desired results on the organizations. In Tunisia, Bahri-Ammari & Carthage (2015) determined that SCM practices indirectly affected the company’s performance through the competitive advantage.

In the local context, Murage (2011) looked into four supply chain practices including demand management, operation management, logistics management and procurement management in the commercial electricity utilities in Kenya. Similarly, Nehemiah (2017) studied three supply chain practices of purchasing, logistics, and customer services in Nairobi, Kenya and found that the practices were significant for business operation. Additionally, Gichuru, Iravo and Arani (2015) grouped supply chain practices into information sharing and resource sharing and found that these practices influenced performance of food industry in Kenya. The study adopted the supply chain practices as highlighted by Gharakhani, Mavi and Hamidi (2012) and Mustefa (2014) to form the basis of this study.

1.1.2 Performance of Large manufacturing firms in Kenya

Globally, financial and non-financial metrics have been used to measure performance. Dawal et al. (2015) postulated that financial and cost indicators should be complemented by non-financial measures related to quality, delivery and flexibility and be integrated with management's strategic objectives. On the other hand, Roberts, Neumann and Cauvin (2017) supported the use of financial metrics to measure performance. Carroll, Johansen and Mouritsen (2011) used market share, return on investment, growth of sales, profit margin on sales, growth of market share and growth of return on investment as the financial metrics for measuring organizational performance.

Regionally, many scholars have adopted the global approach to measure performance. Tucker, Windapo and Cattell (2015) used return on capital employed and profitability to measure financial performance in South African construction companies; Oyerogba, Alade, Idode and Oluyinka (2017) used ROA and earnings per share to measure performance in listed companies in Nigeria while Abdullahi, Abubakar and Ahmad (2017) adopted Profit Margin (PM), Return on Assets (ROA) and Return on Equity (ROE) ratios as a measure of performance while studying oil and gas companies in Nigeria.

Locally, scholars have concurred with the global and regional scholars on the use of both financial and non-financial metrics as performance measurement tools. For instance, Odalo, Njuguna and Achoki (2016) measured organizational performance in terms of market share using sales per year, level of profitability and return on assets. In addition, Rintaugu (2017) used return on equity to measure performance in listed firms in Kenya while Muchiri and Jagongo (2017) measured performance using return on assets in the Kenya Meat Commission in Kenya. The study adopted financial metrics which included return on assets, profitability and market share as postulated by other scholars in the thematic area.

1.1.3 Manufacturing Firms in Kenya

A manufacturing firm uses components, parts or raw materials to make a finished good. These finished goods can be sold directly to consumers or to other manufacturing company that use them for making a different product (Christopher, 2016). According to Czarnitzki, Hanel and Rosa (2011), manufacturing firms in developed countries such as Canada have better performance as a result of being innovative as compared to the developing countries. Similar results were posited by Rodrik (2016) while comparing manufacturing firms in developed countries and developing nations.

In Africa, progress in the manufacturing firms' performance have been seen in the recent years (Dinh & Clarke, 2012). This can be attributed to lower labour costs, land costs and improved social networks. The number of investors from the developed countries such as China has also been on the increase. However, the main challenges facing most manufacturing firms are their small sizes and lack of markets outside their countries. Lack of enough capital and high electricity charges hinder these firms from expanding.

In Kenya, manufacturing firms are registered under the Kenya Association of Manufacturers (KAM) which is a private sector body established in 1959 with a sole purpose representing businesses that deal manufacturing and exporting their products. The body has evolved into a dynamic, vibrant, credible and respected business

association that unites industrialists and offers a common voice for businesses. The body represents organizations for manufacturing value-addition industries in Kenya. KAM provides an essential link for co-operation, dialogue and understanding with the government by representing the views and concerns of its members to the relevant authorities. Its core mandate is policy advocacy, promotion of trade and investment, upholding standards, encouraging the formulation, enactment and administration of sound policies that facilitate a competitive business environment and reducing the cost of doing business (KAM, 2016).

Additionally, there are problems with financing and infrastructure issues in the large manufacturing firms. For instance in Kenya, the capping of interest rates led to commercial banks shifting lending to government as opposed to the private sector. Therefore, as the demand for credit continued to increase following the capping of lending rates, credit to the private sector continued to decline (CBK, 2018). Similarly, the energy charge for industrial consumers increased by more than 30 per cent in the last decade. The increased electricity cost makes Kenyan manufacturers less competitive in a region where the pricing of energy plays a central role in determining the cost of consumer goods and services, and in attracting foreign investors. The tariffs in Kenya are among the highest in the region. The cost of electricity in Ethiopia for example is as low as $0.03 per kWh, Egypt $0.06, South Africa $0.09. Uganda $0.10 per kWh and Tanzania $0.14 per kWh (Africa Check, 2017).

1.2 Statement of the Problem

Manufacturing sector has in the recent past experienced performance issues which include the trade imbalance, drop in GDP and closure of international manufacturing firms in Kenya (Magutu, Aduda, & Nyaoga, 2015). The problem has led to reduced government annual GDP, unemployment, inflation and imbalance of trade resulting to weakening and instability of the currency as a result of increased imports. Kenya had been a priority investment destination in Africa but current stagnation in performance

has led to international organizations preferring other African countries such as Egypt, South Africa and Nigeria (Lee, Thomas, & Wilson, 2016).

Currently, Kenya has a negative trade balance of 12.3 billion dollars in net imports, an increase of 11.6 billion dollars in the last 20 years (OEC, 2017). Further, statistics show that manufacturing firms perform poorly as compared to service industry in Kenya since they involve many processes compared to service industries. For instance, exports of services from Kenya nearly tripled from $1.9 billion in 2005 to $4.9 billion in 2012, whilst exports of goods and services doubled from $5.3 billion to $11.0 billion from 2005-2012 (Khanna, Papadavid, Tyson, & Te Velde, 2016). This is a clear indication that manufacturing firms are performing below par and are less competitive. Poor supply chain practices have been attributed to this performance (Handfield, Cousins, Lawson, & Petersen, 2015). This therefore leads to reduced government annual GDP, unemployment and balance of trade as a result of increased imports.

Further, the GDP from manufacturing sector has been stagnant and in some instances has seen a drop with seasonal fluctuations, for instance, the GDP from Manufacturing in Kenya decreased to Kshs. 113,460 million in the second quarter of 2016 from Kshs. 118,134 million in the first quarter of 2016 (Trading Economics, 2017). The statistics clearly indicate a performance gap which the study aimed to resolve. In the recent past, the country has seen a number of manufacturing industries exit the market in favour of other countries e.g. Eveready, Nestle Cocoa, paper industry and sugar companies (Haron & Arul, 2012).

The research therefore has demonstrated presence of performance problem in the manufacturing sector in Kenya. The study postulates that the performance problem may be as a result of poor implementation of supply chain contemporary practices. Supply chain contributes significantly to the development and growth of organizations, more than any other single department in the organization (Christopher, 2016). The study therefore assessed the influence of contemporary supply chain practices on performance of large manufacturing firms in Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

The main objective of the study was to determine the influence of contemporary supply chain practices on performance of large manufacturing firms in Kenya.

1.3.2 Specific Objectives

The study was guided by the following specific objectives.

1. To determine the influence of green supply chain practices on performance of large manufacturing firms.
2. To establish the influence of customer relationship management on supply chain practices on performance of large manufacturing firms.
3. To assess the influence of supplier relationship practices on performance of large manufacturing firms.
4. To examine the influence of outsourcing practices on performance of large manufacturing firms.
5. To evaluate the influence of lean supply chain practices on performance of large manufacturing firms.
6. To determine the moderating influence of information technology on the relationship between contemporary supply chain practices and performance of large manufacturing firms.

1.4 Research Hypotheses

The following research hypotheses guided the study.

1. H_a: Green supply chain practices have a positive significant influence on performance of large manufacturing firms.

2. H_a: Customer relationship management has a positive significant influence on performance of large manufacturing firms.
3. H_a: Supplier relationship has a positive significant influence on performance of large manufacturing firms.
4. H_a: Outsourcing practices have a positive significant influence on performance of large manufacturing firms.
5. H_a: Lean supply chain practices have a positive significant influence on performance of large manufacturing firms.
6. H_a: Information technology moderates the relationship between contemporary supply chain practices and performance of large manufacturing firms.

1.5 Justification of the Study

1.5.1 Manufacturing firms

The study would be important in establishing the contemporary practices that positively and negatively influence the performance of organizations thereby providing valuable recommendations on the adaptation and implementation of these practices by the manufacturing firms in promotion of governance and world class practices. The study would further promote understanding of the role of information technology in moderating the effect of the application of contemporary practices and the effect on performance of firms. The study would further enable the manufacturing firms to know how to apply the contemporary supply chain practices mix.

1.5.2 Government, regulatory and policy makers

The study has highlighted the consequences of various policies and regulatory framework currently in force and that guide the operation and practices of Kenyan manufacturing firms. The study would therefore be instrumental in guiding the government, regulatory authorities, professional bodies and policy makers on how to improve and address gaps that exist in law that if amended may reduce lacuna as well as

promote governance and implementation of best in contemporary supply chain practices. In addition, the government would use the findings of this study in formulating new policies that will address the challenges that are being faced by the industry.

1.5.3 Business and social firms

The study would be of significance to business and social organizations in general as it would put to light the current contemporary SC practices that are being adopted by the large manufacturing firms in Kenya. The business and social firms might thus use the research findings as a preliminary information on the benefits and challenges of adopting contemporary and world class supply chain practices and might be a starting point for future benchmarking and learning. The study would further promote the development of supply chain department in both manufacturing and service sectors organizations and management in general.

1.5.4 Body of Knowledge

The study would be instrumental to the growth of supply chain as a discrete discipline of social science. The research on the adoption of contemporary supply chain practices would enhance the knowledge of students, scholars and social scientists who may use the findings of this study to further their knowledge or to add value to their research. The study would also bridge information gaps related to contemporary supply chain practices and organizational performance in Kenya. The study will also improve the knowledge on supply chain management, contemporary issues in supply chain as well as the relationship between contemporary supply chain practices and performance.

1.6 Scope of the Study

The study focused on the contemporary supply chain practices practiced by large manufacturing firms in Kenya specifically green supply chain, supplier relationship, customer relationship management, outsourcing and lean supply chain practices and the moderating effect of information technology. The study targeted senior staff in the

finance, procurement and operations departments of manufacturing firms in Kenya listed by the Kenya Association of Manufacturers (KAM). Both primary and secondary data were used in the study. The scope of the study covered the findings or data on contemporary supply chain practices collected between 2016 and 2018 in the large manufacturing firms.

1.7 Limitations of the study

The aim of the research was to assess the influence of contemporary supply chain practices and performance of large manufacturing firms in Kenya. The study therefore was limited in several fronts. The study was hindered by unavailability of the respondents due to their busy schedules. However, the researcher booked appointments with the respondents and therefore was accommodated in their schedules. The other limitation was missing and incomplete information returned. The researcher mitigated this by ensuring that the sample size was large enough and used research assistants to ensure maximum return was achieved. In addition, the information sought in the study was sensitive especially the financial performance of the firms. The researcher mitigated this by availing all the necessary authorization from the university and NACOSTI and also assured of their confidentiality.

The study was limited to large manufacturing firms listed by KAM and therefore the results of the study are limited to unique characteristics and operating environment in Kenya. The study also assessed the performance of firms by analyzing the market share, profitability and return on assets of the firms only. It is a fact that there are other performance indicators such as governance, social responsibility, customer and shareholder satisfaction index though they are qualitative as opposed to quantitative. The study therefore was not able to assess if there were any relationship between adoption of contemporary practices and improvement of organizational performance through other performance indicators other than quantitative metrics.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter covered the theories that were used in the study, review of related literature based on the objectives of the study, the conceptual framework adopted by the study and finally the gaps that were identified by the study. A graphical representation of the conceptual framework was done and how each variable in the study was measured. The theories reviewed have also been linked based on their relevance to the study. A summary of literature was also done as well the research identified in the study based on the objectives. Finally, a chapter summary was given at the end of the chapter.

2.2 Theoretical Review

A theory has been defined as natural or broad explanation of a phenomenon that has been observed and modified over time (Denzin, 2017). This section looked at relevant theories that were in line with the study. The theories covered included; Theory of supply chain constraints, resource based theory, value chain theory, theory of lean six sigma and transaction cost theory. These theories were reviewed and their relevance to the study was also provided per theory. This helped guide the study by identifying the gaps and relevant areas which the study picked in its discussion.

2.2.1 Theory of Supply Chain Constraints

Identification of constraints is one of the most effective ways of optimizing any organization's performance. According to Goldratt (1990), the theory of constraints (TOC) is a management paradigm that views any manageable system as being limited in achieving more of its goals by a very small number of constraints. There is always at least one constraint, and TOC uses a focusing process of identifying the constraint and restructuring the rest of the organization around it.

Goldaratt (1990) argues that the theory of constraints has five critical steps namely identification of the system's constraints, the exploitation of the system's constraints, subordination and synchronization of the constraints, elevation of the system's constraints and going back to the first step in case in the previous steps, a constraint has been broken. The five focusing steps ensure ongoing improvement efforts are centered on the organization's constraints.

The theory of constraints is important in the study because it is linked with the study objectives on outsourcing and supplier relationship. The constraints that an organization has are likely to affect the costs, time delivery, customer satisfaction and overall performance of the organization. The relationship between the organization and its suppliers will be affected if the organization has more constraints than when the constraints are few. In addition, suppliers may get disappointed when an organization keeps on rejecting their raw materials and failing to make timely payments due to the constraints. Through good collaboration between the organization and suppliers, constraints can be resolved.

Once constraints are exploited, delivery of services will be enhanced hence resulting in customer satisfaction. The theory was important in the study in determining the measures that the organizations have put in place to overcome the constraints in their supply chains. Further, the theory was used in the study to determine whether the organizations determined the services to be outsourced so that the constraints could be overcome.

2.2.2 Resource Based View Theory

The Resource-Based View (RBV) arose from a diversion since the early 1980's towards considering internal resources and capabilities as the primary source of competitiveness. Barney (1991) and Wernerfelt (1984) developed the resource-based theory around the internal competencies of firms and turned the interest of strategic management towards the inside of the firm. According to RBV competitive advantage is rooted in a firm's assets that are valuable and inimitable. The new perspective expects firms to compete

based on their unique or distinctive internal capabilities, competencies and resource capabilities (Hoskisson, Hitt, Wan & Yiu, 1999). A firm's capabilities or competencies and management ability to marshal the resources and their deployment patterns to produce superior performance determine competitive advantage (Grant, 1991).

ERP systems have been applied by many firms around the world as a key part of the organizational infrastructure. These systems tend to have a long life cycle in organizational use, and their processes have been extended into external organizations across the industry value chain (Wieder, Booth, Matolcsy & Ossimitz, 2006). Various impacts have been reported in different levels of organizational practice such as operational gains, effective decision-making, and increased competitiveness. Different resources are applied for achieving success in the different stages of ERP implementation and utilization such as top management support, IT infrastructure, cultural infrastructure and organizational structure. These resources are meant to enhance the process of creation, retention, transfer and application of knowledge throughout the ERP implementation process (Palanisamy, 2008).

Firms continually search for new ways to increase productivity and efficiency. New knowledge yields new ways of using existing resources or new ways of combining sets of resources. The resource-based theory informs understanding of the linkage between the type of IT and the nature of business process and organizational performance impacts (Bharadwaj, 2000). Due to its focus on resource attributes and its usefulness in examining the IT resource, the study will adopt resource-based view to help explain the variables on technology, skills management, integration, knowledge and information channeling and globalization.

This theory supported the application of information technology as a resource for promoting and facilitating the adoption of contemporary supply chain practices and therefore promote increased performance of organizations. The theory was of importance in determining the type of information technologies adopted, the necessary

skills needed by the organizations in their running and deployment of resources by ensuring effective and efficient supply chains.

2.2.3 Value Chain Theory

Value chain theory entails the process view of organizations in which manufacturing (or service) organizations are viewed as systems which are made up of subsystems with inputs, transformation processes and outputs (Porter, 1985). Organizations engage in various activities in the process of converting inputs to outputs. These activities can be classified generally as either primary or support activities that all businesses must undertake in some form. The primary activities include inbound logistics, operations, outbound logistics, sales and marketing and customer service. The secondary activities include firm infrastructure, human resources, technology development and procurement.

This theory helped the study to determine how organizations were able to link the various activities such as logistics, operations and customer service through the adoption of information technology, procurement and human resource use in achieving firm's objectives. Proper use of the technology and human resources is likely to help the organization improve its performance. The theory supported the customer and supplier relationship variable by explaining the importance of incorporating suppliers and customers in the value chain in an attempt to add value and improve organizational performance.

2.2.4 Theory of Lean Six Sigma

Lean six sigma theory is an approach for improving efficiency through complexity and cost reduction. Lean six sigma principles follow sequential steps that target the reduction of costs and increase in profits as well as identifying opportunities for increasing collaboration (Pyzdek & Keller, 2014). Sehwail and DeYong (2003) asserts that this theory can be used as an analytical tool to define both facilitating and hindering factors that shape customer satisfaction and prevent corporations from achieving their financial and operational goals. Lean six sigma is a methodology that relies on a collaborative

team effort to improve performance by systematically removing waste, combining lean manufacturing/lean enterprise and Six Sigma to eliminate the eight kinds of waste: transportation, inventory, motion, waiting, over production, over processing, defects, and skills (Devane, 2004).

Salah, Rahim and Carretero (2010) suggest that leading consulting firms such as McKinsey, Deloitte, Bain & Company, and Booze Allen have reported that the Lean Six Sigma methodology provides the foundation upon which they evaluate a company's performance using organizational design, product quality, supply chain management, logistics, innovation, finance, market share, and customer satisfaction. According to Palagyi, Hamelynch, Mehta and Roussel (2003), the use of Lean six sigma provides techniques to evaluate measure and improve areas within a company that are inefficient or have poor outcomes, such as costs untimely delivery of products and delivery of damaged goods.

The theory of lean sigma six was useful in the study in the measurement of the organizations performance in terms of product quality, supply chain management, logistics, and innovation, finance and market share. The theory was also in line with the objective on green supply chain where it helped the study determine the various ways adopted the manufacturing firms in eliminating wastes in transportation, inventory, logistics, production and defects. The theory was also linked to the study objective on lean supply chain through combination of lean manufacturing and lean enterprise.

2.2.5 Transaction Cost Theory

Transaction cost theory gives a rationale on the existence of organizations and the reason why these organizations expand or source out activities to the external environment (Aldrich, 2008). The transaction cost theory suggests that firms try to minimize the costs of exchanging resources with the environment, and that they try to minimize the bureaucratic costs of exchanges within the company. Companies therefore weigh the costs of exchanging resources with the environment, against the bureaucratic costs of performing their activities.

This theory looks at institutions and markets as different possible forms of organizing and coordinating economic transactions. When external transaction costs are higher than the company's internal bureaucratic costs, the company will grow, because the company is able to perform its activities more cheaply, than if the activities were performed in the market. However, if the bureaucratic costs for coordinating the activity are higher than the external transaction costs, the company will diminish (Langlois, 1992).

The transaction costs related to the exchange of resources with the external environment could be reflected by environmental uncertainty, risks, core company assets, opportunism and bounded rationality (Bahli & Rivard, 2003). These factors will potentially increase the external transaction costs, where it may become rather expensive for an organization to control these factors. This implies that if organizations view the environmental uncertainty as high, they might choose to not outsource or exchange resources with the environment.

The transaction cost theory was useful to the study in deciding which service to be outsourced by manufacturing organizations, through studying the environment in which the firms were situated. They can also conduct market analysis on risk assessment and determine how the risks are likely to affect their supply chains. This theory therefore was in line with the outsourcing strategy. The theory emphasizes on the importance of outsourcing as a way of reducing transactional cost and by extension increase the organization's bottom line.

In summary, the study was guided by the objectives of the study were the influence of green supply chain practices, supplier relationship practices, customer relationship management practices, outsourcing practices, lean supply chain practices on performannce of large manufacturing firms in Kenya and the moderating effect of information technology on contemporary supply chain practices on performance in the large manufacturing firms in Kenya. The theory of Supply Chain Constraints supported the concept of outsourcing while resource based view theory supported the application of IT as a resource for promoting contemporary supply chain practices. On the hand,

value chain theory reinforced customer and supplier relationship variables by incorporating supplier and customers in the value chain. The theroy of lean six sigma was useful in the study of lean supply chain while transaction cost theory underpinned the concept of outsourcing.

2.3 Conceptual Framework

A conceptual framework is a system of concepts, assumptions, expectations, beliefs, and theories that supports and informs research (Robson & McCartan, 2016). The framework explains either graphically, or in narrative form, the main things to be studied i.e. the key concepts, factors or variables and their presumed relationship. The dependent variable for the study will be organizational performance while the independent variables are green supply chain, technology, supplier and customer relationship management, outsourcing and lean supply chain.

The study used the reverse logistics, waste management and energy management to operationalize green supply chain practice; customer involvement, visibility and communication to measure the level of customer relationship management; collaboration, involvement and selection were used to establish the level of supplier relationship; cost management, contract management and sourcing to operationalize outsourcing practice; agility, outbound and inbound logistics and lean production were used to measure lean construct in supply chain; integration, innovation and efficiency of the information systems were used to assess the moderating effect of the information technology. Finally, market share, profitability and return on assets assessed the level of organizational performance as presented in Figure 2.1.

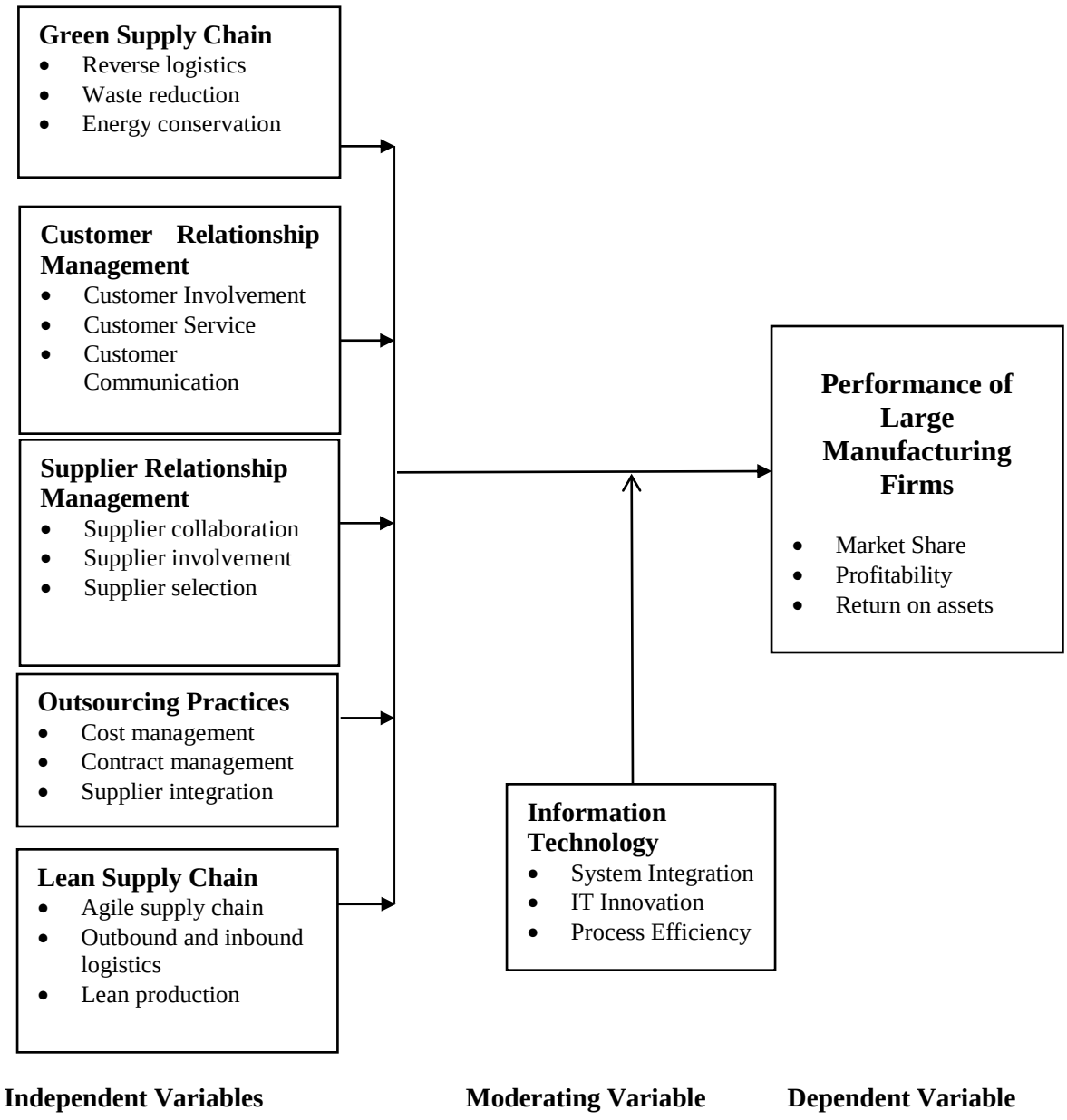

Figure 2.1: Conceptual Framework

2.3.1 Green Supply Chain

Green supply chain enhances the economic advantages such as economy of production, increasing competitive advantage and increasing profit (Andic, Yurt & Baltacıoglu, 2012). Further, Laosirihongthong, Adebanjo and Choon Tan (2013) added that there is a positive relationship between adopting GSCM practices and enhanced reputation and brand image of an organization. Green supply chain enhances the economic advantages such as economy of production, increasing competitive advantage and increasing profit. Green supply chain is conceptualized by reverse logistics, waste reduction and energy conservation (Guerrero, Maas, & Hogland, 2013).

Reverse logistics entails the process of planning, implementing, and controlling the efficient, cost effective flow of raw materials, in-process inventory, finished goods and related information from the point of origin to the point of consumption for the purpose of conforming to customer requirements (Antonyova, Antony, & Soewito, 2016). More precisely, reverse logistics is the process of moving goods from their typical final destination for the purpose of capturing value, or proper disposal. In the manufacturing sector, reverse logistics is more than reusing containers and recycling packaging materials. Redesigning packaging to use less material, or reducing the energy and pollution from transportation are important activities, but they might be secondary to the real importance of overall reverse logistics (Jain & Khan, 2017).

Waste reduction techniques should be key components of any cost-effective, comprehensive waste management program. Available techniques range from easy operational changes to complex operational modifications. The common factor in these techniques is that they reduce bottom-line operational costs (Bennett & James, 2017). Waste reduction techniques can be broken down into four major categories: managing inventory, modifying production processes, reducing waste volume, and recovering waste. In actual application, waste reduction techniques generally are used in combination in order to achieve the maximum effect at the lowest cost (Loyon, et al., 2016).

Energy conservation entails enhancing efficiency of energy consumption throughout an organization. This implies reducing the consumption of non-renewable resources to ensure that energy is prevented from being wasted (Banerjee, 2015). Energy conservation means using energy more efficiently, and is often a technological change. This measures the difference between how much energy is used to provide the same level of comfort, performance or convenience by the same type of product, building or vehicle. It ranges simple tasks such as turning off lights on a frequent basis to improvement of efficiency of energy through use of technological improvement (Brunke, Johansson, & Thollander, 2014).

2.3.2 Customer Relationship Management

Customer relationship describes the process through which an organization interacts with customers and in the process capture information about the customers' tastes and preferences for the purposes of enhancing customer satisfaction (Kumar & Reinartz, 2018). In addition, CRM involves using technology to gather the intelligence the organization needs to provide improved support and services to the customers. Further, CRM entails how the organization uses the information to better meet the needs of existing customers and identify new customers, resulting in higher profits (Soltani & Navimipour, 2016).

Customer relations can be developed by organizations or business for establishing and maintaining relationships with their customers. In the modern world, businesses rise and fall as a result of customer base support. Hence, it is absolutely essential that an organization or business develops effective customer relations (Kumar & Reinartz, 2018). According to Ulaga and Loveland (2014), in order to enable organisations to become more efficient and effective in delivering products and services to customers, knowledge on firms' customers needed to be managed to ensure that the services that were provided by the organizations were those that addressed customer needs. Knowledge management is, therefore, an integral part of customer relationship management and ebusiness.

Customer relationship also includes caring for the customers. Customer service is defined as an organization's ability to meet the needs and desires of its customers. Excellent customer service is a vital part of marketing of products and services (McDonald & Wilson, 2016). Customer service helps to discover customer dissatisfaction, identify customer needs, compare performance with competitors and determine opportunities for improvement. It thus helps an organization to consistently exceed the expectations of its customers. Customer service is displayed in the presentation of the firms' products and services as well as in the attitude, knowledge and behavior of employees. Customer service begins before a customer arrives and ends long after the customer leaves your enterprise (Gursoy, Cai, & Anaya, 2017).

2.3.3 Supplier Relationship Management

Supplier relationship management is a comprehensive approach to managing an enterprise's interactions with the organizations that supply the goods and services it uses (Monczka, Handfield, Giunipero, & Patterson, 2015). SRM is a systematic, enterprise-wide assessment of suppliers' assets and capabilities in view of the organizations overall business strategy. SRM helps to determine what activities to engage in with different suppliers, and planning and execution of all interactions with suppliers, in a coordinated fashion across the relationship life cycle, to maximize the value realized through those interactions (Hill & Alexander, 2017). The focus of SRM is to develop two-way, mutually beneficial relationships with strategic supply partners to deliver greater levels of innovation and competitive advantage than could be achieved by operating independently or through a traditional, transactional purchasing arrangement (Shukla, 2016).

Supplier Relationship Management (SRM) can be used to connect the different interests both within the organization and with the extended supply chains. For a successful relationship, six methods have been identified; collaborate in areas where an organization has already established a solid footing, turning win-lose situations into win-win opportunities with the right benefit-sharing model, selection of partners based on

capability, strategic goals, and value potential, investment in the right infrastructure and people between organizations, establishment of robust, joint performance and management systems and creation of long term collaborations (Linoff & Berry, 2011).

For supplier selection process to be effective in any manufacturing organization, the objectives should include reduction of purchase risk, maximization of overall value to the purchaser, and development of closeness and long-term relationships between buyers and suppliers in today's competitive industrial sector (Pal, Gupta & Garg, 2013). Five steps to successful supplier selection have been identified by Aksoy and Ozturk (2011) as supplier selection scorecard, identification of suitable suppliers, scorecard ranking, negotiation and creation of contract and activation of purchasing systems. Shukla (2016) concured with the steps when his study identified the steps as identifying suppliers, soliciting information from suppliers, setting contract terms, negotiating with suppliers, and evaluating suppliers.

2.3.4 Outsourcing Practices

Outsourcing is a practice used by different companies to reduce costs by transferring portions of work to outside suppliers rather than completing it internally (Kahraman, Oztaysi, & Onar, 2016). Outsourcing is one of the most effective activities in contemporary supply chain because many companies use innovations of science, techniques and technologies to issue qualified and competitive product which will satisfy the consumer. This leads to essential reduction of expenses on production of the end product because each part works on that it can do best without applying additional effort and without investing for learning new activity types (Almutairi & Riddle, 2018).

According to Ramanathan and Gunasekaran (2014), outsourcing success can be measured in terms of the impact it has on organization performance and customer satisfaction. Organization performance from an outsourcing view can be measured by assessing the degree of achievement of the strategic, economic, output and other technological benefits of outsourcing contract. Customer satisfaction can also be viewed

as the level of acceptance or fitness between a customer requirement and outsourcing outcome. Outsourcing success can be measured by use of items such as; access to skilled personnel, economies of scale in human and technological resources, risk reduction in technological obsolescence and increased access to key information technologies (Lee & Choi, 2011).

Supplier contract management is an outsourcing practice which ensures improved performance by setting, reviewing, and monitoring key performance indicators. It helps to watch over the finances to adhere to budgets, billing and payment, total cost of contract, and trends. Similarly, it helps in proper record keeping and reporting and captures real-time audit trails and reporting. Contract management also helps in handling disagreements and disputes and thus prevents unnecessary litigations. In addition, it helps to identify and prioritize risks, tracking, and resolution, maintain market intelligence and drive continuous improvement (Dutton, 2015).

2.3.5 Lean Supply Chain

Lean Supply Chain is defined as the supply chain without any extra processes that does not add value to the supply chain it is important because of the definition it removes the unneeded processes which will reduce production cost (Mangan & Lalwani, 2016). A lean supply chain network is empowered to execute superlative, unique customer-winning value at the lowest cost through the collaborative, real-time synchronization of product/service transfer, demand priorities, vital marketplace information and logistics delivery capabilities (Cooper, 2017). Lean supply chain in the study was conceptualized using agile supply chain, outbound and inbound logistics and lean production.

Lean supply chain management can be used as a method of reducing costs and lowering waste as much as possible. Most organizations have a big budget on material procurement and hence it is important that the materials are used in the best way possible to reduce on costs and for maximum performance. This is important for

organizations with high volumes of purchase orders since waste and costs can accumulate quickly (Chitale & Gupta, 2014).

Agility provides benefits to the supply chain industry and hence maintaining agility, supply chain entities can adapt to high variety, sudden changes in volume (Salmon, 2014). However, this implies the supply chain may not be able to produce a high volume of goods if certain materials are available. Therefore, supply chain entities which implement agile supply chain solutions understand that real-time data means the sudden change in demand can occur without warning.

2.3.6 Information Technology

Information technology boosts productivity and reduces transaction and information costs. It allows new models of collaboration that increase workers' efficiency and flexibility. ICTs foster entrepreneurship and create new business models (Shale, 2015). Furthermore ICTs offer significant social benefits, notably by enabling access to basic services, including financial services and education. Widespread ICT use by businesses, government, and the population at large is a precondition for all these benefits and opportunities to materialize (Dutta, Geiger, & Lanvin, 2015).

Managers should account for (multiple) contingencies (observed and unobserved) while assessing the effects of IT competencies on organizational agility and firm performance (Chakravarty, Grewal, & Sambamurthy, 2013). Systems from one department to another e.g. stores and users can be linked together such that those booking materials can confirm from the system if the desired materials are available before booking (Scheer, 2012).

ERP systems have been used by many organizations all over the world as a key part of the organizational infrastructure. These systems have been observed to have a long life cycle in organizational use, and their processes have been extended into external organizations across the industry value chain (Chang, 2016). High interdependence

among organizational sub-units, contributes to the positive ERP-related effects because of ERPs ability to coordinate activities and facilitate information flows. Nevertheless, when there is high differentiation among sub-units, organizations may incur ERP-related design costs (Waters & Waters, 2013).

2.3.7 Performance of Large Manufacturing Firms

Organizational performance refers to the extent to which an organization achieves a set of pre-defined targets that are unique to its mission, vision and goal. These targets will include both objective (numerical) and subjective (judgmental) indicators (Maduenyi, Oke, Fadeyi, & Ajagbe, 2015). Studies have used market and financial criteria to operationalize organizational performance in terms of market share, return on investment, growth of sales, profit margin on sales, growth of market share and growth of return on investment. These studies have also contributed to the investigation of the relationship among operational performance, organizational performance and SCM practices (Carroll, Johansen, & Mouritsen, 2011).

There are basically three main categories of supply-chain driven organizational performance (Wu, Chuang, & Hsu, 2014). The first category, resource performance, sees value as a way of achieving efficiency. The second category, output performance, sees value addition as the ability of an organization to provide high levels in customer service. The last category, flexibility performance, sees value addition as the ability of an organization to respond. These categories have seen increased attention by researchers in the recent years.

2.4 Empirical Literature Review

This section covers the review of related literature to the study. The empirical review is done based on the variables of the study on green supply chain, technology, supplier and customer relationship management, outsourcing, lean supply chain and organizational performance. The section has been arranged on sub-sections based on these variables.

Empirical review has been done based on the methodologies, results and recommendations that relevant related studies have done in the context of contemporary supply chain practices. The gaps that exist in these studies have also been identified.

2.4.1 Green Supply Chain

Niemann, Kotze and Adamo (2016) in their study on the drivers and barriers of green supply chain management implementation in the Mozambican manufacturing industry, identified four drivers and eight barriers that affect the adoption of green supply chain. The study adopted a qualitative approach in form of semi-structured interviews with one senior manager in eight different organisations in the industry. The study found that corporate social responsibility, internal organisational policies, and board and top management support were the most important drivers while culture, costs and government legislations were identified as the barriers with the greatest impact.

Ravi and Shankar (2015) in their attempt to investigate the current status of reverse logistics practices used on four sectors of Indian manufacturing industry, adopted a survey method and argued that firms give more importance to the aspect of reverse logistics. The study found that Indian companies adopted reverse logistics as a result of economic benefits associated with the practice. The study also found that reverse logistics is one of the most important strategic management decisions that can assist organization improve its productivity.

Ye, Zhao, Prahinski and Li (2013) investigated the effects of three institutional pressures on top managers' posture towards reverse logistics implementation: government, customer, and competitor pressures. The study surveyed 209 manufacturers of Pearl River Delta in China and found that although product recovery had a significant positive impact on both economic and environmental performance, product return had a negative impact on the firms' economic performance and no effect on the firm's environmental performance. The study also found that 6% of customers returned products purchased

and therefore reverse logistics should be viewed as a critical process by organizations so as to improve performance.

Ebrahiem and Eldin (2015) investigated waste management practice among restaurants in Petaling Jaya city, Malaysia with reference to the compliance, awareness on waste management, and incorporating these findings on waste management practice. The study was done using two approaches; survey to study the compliance of the restaurants to the Local Government Act (LGA) 1976 and questionnaire. The study found that only a few operators were aware of the waste management practices although the compliance level was high.

Guerrero, Maas and Hogland (2013) in their study on the solid waste management challenges for cities in developing countries noted that recycling has become part of life in many developed countries such as Denmark, Japan, Germany and Singapore. The objective of the study was to determine the stakeholders' action/behavior that have a role in the waste management process and to analyze influential factors on the system, in more than thirty urban areas in 22 developing countries in 4 continents. The study used secondary data obtained from scientific literature and existing data bases. The study found that recycling performance indicators involved environmental, economic and social issues. The authors recommended that these indicators needed to reflect the industrial ecology ambition of closing material and energy loops, reflect the function and the performance of the system, reflect global environmental concern or business value, be relevant, understandable, meaningful and useful for decision-makers, support system-oriented decision makers and define data and methods for measurement.

2.4.2 Customer relationship management

Feng, Cai, Zhang and Liu (2016) investigated the role of customer involvement on new product performance as well as examine the influence of information technology on the relationship between customer involvement and new product performance. The study adopted a survey method where data was collected from 214 Chinese manufacturing

firm. The study found that customer involvement was influenced by the level of information technology implemented by the organization.

Cheung and To (2011) conducted a study on customer involvement and their perceptions on service performance. The study reviewed secondary data from responses of 349 Chinese banks customers and analysed using regression analysis. The study found that customer involvement was related to perceived service performance and that positive relationship between customer involvement and perceived service performance was stronger on customers of a high rather than low level of co-production. The study also revealed that customers and their perceptions of service performance had implications for both managers and consumer services researchers.

Bashir, Machali and Mwinyi (2012) carried out a study on the effect of service quality and government role on customer satisfaction using empirical evidence of microfinance institutions. The study surveyed thirty six respondents from K-rep and Kenya Women Finance Trust (KWFT) branches in Mombasa. The authors found out that the effect of service quality on customer satisfaction was positive and significant. The study confirmed that the role of government on customer satisfaction was insignificant. This implies that government needed to develop strategies towards improving the role of microfinance institutions in mitigating the poverty. In order to provide products that customers needed to have, their involvement was paramount.

2.4.3 Supplier Relationship Management

Lambert and Schwieterman (2012) in their study on Supplier Relationship Management (SRM) as a macro business process in Ohio aimed at describing the macro level cross-functional view of SRM and to provide a structure for managing business-to-business relationships in order to co-create value and increase shareholder value. The study used focus groups to collect data and determined that reports in performance measurement are designed to show the impacts of profitability of individual customers on the organization's financial performance, close relationships needed to be developed with a

small subset of suppliers based on the value that they provided to the organization over time and that customer service managers needed to interact with other process teams, such as supplier relationship management and manufacturing flow management to ensure delivery of products and services in timely version.

Gudda and Bwisa (2013) studied the effect of clustering and collaboration on product innovativeness in the manufacturing firms. They sampled 126 Small and Medium Enterprises (SMEs) on the basis of the manufacturing hubs of Kisumu, Kenya. The study determined that there was a relationship between clustering and collaboration on product innovativeness. Further, the study concluded that efforts in designing different supportive actions for different cluster manufacturing SMEs based on their product knowledge gaps within the wider innovation policy initiatives could be adopted.

Okatch, Mukulu and Oyugi (2011) carried out a study on the motivation behind subcontracting relationships between large firms and small and medium enterprises in the motor vehicle manufacturing industry using three motor vehicle assembles in Kenya. The study found out that the level of subcontracting that takes place in the motor vehicle manufacturing industry was minimal. This was motivated mainly by a desire to remain in the good books of the government. The big enterprises were not willing to buy component parts from local suppliers due to the inability to supply quality products to schedule and lack of local suppliers for certain parts. The proliferation of makes and models required frequent technological changes which both assemblers and SMEs owners finding it difficult to keep up. The study recommended that the a way of compelling the franchise holders and assemblers to buy parts locally needed to be improvised and that SMEs needed to acquire up to date technology in order to become more competitive.

Nyamasege and Biraori (2015) also conducted a study on the factors affecting the effectiveness of supply chain management practices in Kenyan public sector in the national treasury. The study used a descriptive case research design with a sample size of 60 management staff working in the ministry. The study determined that lack of

supplier relationship management strategies lowered the effectiveness of supply chain management functions. The study therefore recommended that there needed to be application of supplier collaboration strategies in the ministry.

Mwikali and Kavale (2012) conducted a study on the factors affecting the selection of optimal suppliers in procurement management. The study used secondary data to determine the factors considered in selecting suppliers in procurement management. The findings of the study indicated that factors affecting selection of suppliers were cost, technical capability, quality assessment, organizational profile, service levels, supplier profile and risk factors. The study further concluded that cost criterion is a key factor affecting supplier selection for it dictates among many elements, the profit margins. Additionally, technical capability, quality of materials and the profile of the supplier needed to be closely considered.

2.4.4 Outsourcing practices

Halim, Ahmad and Ramayah (2016) studied the Impact of outsourcing on performance and competitive priorities among Malaysian SMEs. A data sample of 100 SMEs was analyzed using partial least squares. The study findings indicated that while outsourcing has significant influence on SMEs performance, outsourcing activities did not have an impact on competitive priorities. Outsourcing approach emphasized on the establishment of core competitive advantage to allow numerous benefits such as overall sales growth, market share, net profit, return on investment and financial liquidity.

Khan and Khan (2013) on the critical success factors for offshore software outsourcing contract management from vendors' perspective using secondary data revealed that there existed three stages of the outsourcing contract which included pre-contract, during contract and post-contract. The study revealed that contract flexibility, trustworthy relationship management, competitive bidding, consultation and negotiation and quality management were considered as the critical success factors for outsourcing vendor organisations in planning, management and execution of outsourcing contract.

Raassens, Wuyts and Geyskens (2014) studied the performance implications of outsourcing customer support to service providers in emerging versus established economies. The study used secondary data to do comparisons between developed and developing economies. The findings indicated that customer-support outsourcing to emerging markets is less beneficial for services that are characterized by personal customer contact and high knowledge embeddedness than for customer-support services that involve impersonal customer contact and are low on knowledge embeddedness. The study further determined that firms higher in marketing resource intensity and larger firms benefit more from outsourcing customer-support services to emerging markets than firms lower in marketing resource intensity and smaller firms.

Magara, Oloko and Nyangau (2014) studied the effect of global sourcing on profitability of medium motor vehicle firms in Nairobi county a survey method. The study determined that currency fluctuations and government policies affected the businesses greately affecting the financial performance of motor vehicle firms. The study recommended that if government policies were implemented correctly, most firms in the sector could improve their financial performance. Further, this could increase their competitive edge to match their counterparts across the region.

Nyaboke, Amemba and Osoro (2013) during a study on the factors affecting performance of outsourcing practice in the public sector in Kenya used secondary data in their data colletion process and concluded that to realize a competitive advantage from outsourcing required a strategic orientation. This could be done through strategic analysis, rigorous vendor selection, contract negotiation and proper contract management. Firms would therefore outsource functions that are resource intensive, such as high labour, high capital investments, those requiring specialist competencies and those dependent on the rapidly changing technology.

Bosire, Nyaoga, Ombati and Kongere (2013) conducted a study on the impact of outsourcing on lead-time and customer service in supermarkets in Nairobi-Kenya. The authors collected data from a sample of fifty (50) supermarkets within Nairobi. The

study revealed that supermarkets mainly outsourced advertising and marketing. Consultancy and training, administration of information and systems maintenance, security, facilities maintenance, general maintenance and repair were also largely outsourced. The findings also determined that outsourcing and lead time were positively correlated.

2.4.5 Lean Supply Chain

Arif-Uz-Zaman and Nazmul Ahsan (2014) studied lean supply chain performance measurement; the study used a fuzzy model to evaluate the performance of cost competitive supply chains. The study determined that that the performances for lean supply chain compare to non-lean situation were significantly better in cost and time competitive strategies than quality and flexibility. The study concluded that lean performance evaluation model for Motion Pant supply chain was more effective in cost and time competitive strategy.

Xu, Wijesooriya, Wang and Beydoun (2011) in their on outbound logistics exception monitoring using a multi-perspective ontologies' approach with intelligent agents aimed at developing multi-perspective ontologies for outbound logistics exceptions, a multi-agent system assists outbound logistics exception monitoring and to develop an effective use of information systems in logistics monitoring. The findings indicated that the proposed multi-perspective ontologies provide better understanding of exceptions thereby enabling the designed outbound exception monitoring system to perform well.

Dwayne Whitten, Green Jr and Zelbst (2012) carried out a study using a theory on Triple-A supply chain performance model that incorporates Triple-A supply chain status as antecedent to supply chain performance. The study sampled 132 national supply chain professionals in Texas and found out that Triple-A supply chain strategy positively affected supply chain performance and that, in turn, supply chain performance positively impacted on organizational performance. Further, supply chain performance had a stronger positive relationsip with marketing performance than financial performance of

the organization. The authors further argued organizational success depended on the agility, adaptability, and alignment of supply chains.

Otieno, Ondiek and Odera (2012) conducted a study on the factors causing reversed bullwhip effect on the supply chains of Kenyan firms. The study purposely sampled five depots of the Kenya Pipeline Company. The findings indicated that capacity constraint was the major factor contributing to supply chain inefficiency. The study concluded that the supply chain was inefficient because of capacity challenges and government intervention. Therefore, the study recommended that an implementation of capacity adjustment strategies, equipment upgrade, additional time, reliable source of power and a non-disruptive government intervention so as to manage the bullwhip effect and allow the firms to operate lean inventory.

2.4.6 Information Technology

Shale (2015) in his study on the role of fleet management optimization on supply chain performance in oil industry in Kenya in Hass petroleum oil refinery examined the effect of cost reduction on supply chain performance, ICT integration, effect of top management support and the effect of lead time on supply chain performance in oil sector in Kenya. The study determined that cost reduction, ICT integration, top management support and lead time all affected management optimization. The study recommended that the organizations needed to have a seamless flow of information in order to achieve management optimization.

Marinagi, Trivellas and Reklitis (2015) studied information quality and supply chain performance and the mediating role of information sharing. The authors used survey method to collect data from 61 manufacturing firms in Greece and confirmed the mediating role of information sharing. The main implication of the findings for managers was that information sharing among partners along the supply chain facilitated higher overall performance, as a result of enforced supply chain management practices elevating information reliability and quality.

Wanyoike, Mukulu and Waititu (2012) conducted a study on Information Communication Technology (ICT) attributes as determinants of e-commerce adoption by formal small enterprises in urban areas. The authors used stratified random sampling to select a sample of 400 small enterprises located in four main urban towns of Kenya. The findings indicated that small formal enterprises adopted e-commerce by which enabled them to observe visible results emanating from efficient coordination among various value chain partners and improved customers services that led to customer satisfaction. Most entrepreneurs viewed e-commerce as an avenue of venturing into new markets but not as a tool for developing new products and services.

2.4.7 Performance of Large Manufacturing Firms

Prajogo, Oke and Olhager (2016) studied supply chain processes by linking supply logistics integration, supply performance, lean processes and competitive performance. The study sampled 232 Australian manufacturing firms in testing the hypothesized relationships. The findings showed that there was no significant direct relationship between supply logistics integration and competitive operational performance. The relationship was fully mediated by inbound supply performance and internal lean production processes. Further, lean production processes had a positive effect on inbound supply performance.

Carr (2016) studied relationships among information technology, organizational cooperation and supply chain performance. The study discussed the use of information technology and the role of inter-functional and inter-organizational cooperation in supply chain organizations. The study further explored the concept of cooperation as an approach to improving relationships and performance outcomes. Based on the literature, a model depicting the relationships between information technology, communications methods, cooperation, and performance was presented and determined that there was a relationship among information technology, organizational cooperation and supply chain performance.

Daniel (2016) studied critical factors affecting supply chain management in brewery manufacturing firms in Ethiopia. The study used quantitative and qualitative research design. The findings indicated that the relationship of factors, production scale and product quality had a less correlation with supply chain integration and a moderate correlation with customer focus and innovation and a strong correlation with marketing and distribution. The study recommended that the breweries companies in Ethiopia needed to identify the portfolio of key initiatives that would help transform their traditional supply chain into a demand-driven value network.

Odalo, Njuguna and Achoki (2016) used the theory of the firm growth to determine the influence of increments in sales over the years on financial performance. A panel design with descriptive and causal study design was adopted and all the listed companies in the agriculture sector in Kenya were studied. Sales increments in each year was used as a measure of sales growth while financial performance was measured by return on assets (ROA), return equity (ROE) and earnings per share (EPS). The study affirmed that sales growth had a positive and significant effect on financial performance measures ROA and ROE and negative and insignificant effect on EPS.

2.5 Critique of Existing Literature

The study proposed to determine the influence of contemporary supply chain practices on organizational performance in large manufacturing firms listed by KAM in Kenya. The study found that most empirical studies in the subject area focused on the individual contemporary supply chain practices and their relationship with organizational performance and even some only focused on some aspects of contemporary practices. For instance, Hassan, ElBeheiry and Hussein (2013) focused only on green supply chain as a driver of organization performance; Lau (2011) on customer relationship management and organizational performance; Khan and Khan (2013) delved only on successful execution of outsourcing and Otieno, Ondiek and Odera (2012) on bullwhip effect as a consequence of poor lean adoption.

Although most scholars cited by the research were able to determine the relationship between independent variables and organizational performance they were silent on the moderating effect of information technology (Lambert & Schwieterman, 2012). Most scholars viewed information technology as a distinct independent variable as opposed to a moderator. Information technology leverages the impact of supply chain practices across the entire organization and therefore is best viewed as a moderator as opposed to a standalone variable (Vanpoucke, Vereecke, & Muylle, 2017).

Further, the empirical review on the subject matter reviewed showed that most studies conducted in Kenya concentrated mainly on the service industries such as banks, hotels, hospitals and retail sector (Bashir, Machali, & Mwinyi, 2012; Mwikali & Kavale, 2012; Bosire, Nyaoga, Ombati, & Kongere, 2013). The research need to corroborate the findings of these past research with the findings in the manufacturing sector as the operating environmment may be different.

Similarly, some scholars only relied on secondary data to analyse the phenomenon (Mwikali & Kavale, 2012; Khan & Khan, 2013). The challenges of solely relying on secondary data as been well documented. Critical shortcomings may range from the data being out of context with the study, explicity and implicit errors being adopted in the subsequent studies and the environment may have changed during the time of subsequent research (Johnston, 2017). The use of secondary data should be ideally combined with the primary data so as to provide accurate and most reliable information.

Also, some empirical reviewed data adopted a qualitative approach to collect and analyze data (Hassan, ElBeheiry, & Hussein, 2013; Lambert & Schwieterman, 2012). Qualitative approach is the use of opinions and suggestions as opposed to numerical data. Qualitative research is sometimes defined as interpretive research, and as interpretations can be incorrect or biased, the findings may be controversial and lacks confidentiality (Sanjari, Bahramnezhad, Fomani, Shoghi, & Cheraghi, 2014).

Finally, the study also noted that some studies had used inadequate sampling size which can render the results skewed and inaccurate (Okatch, Mukulu, & Oyugi, 2011). According to Garg and Kothari (2014) the sample size should be adequate and must be representative enough i.e. it should be more than 30 units except in small populations. Survey method is best suited for small populations as adopted by Ebrahiem and Eldin (2015). The study purpose to apply stractified random sampling and a descriptive research approach to corroborate the findings of the other scholars.

The study reviewed past studies that focused on contemporary supply chain practices and organizational performance. Most studies indicated a positive relationship between green supply chain, customer relationship management, supplier relationship, outsourcing and lean and organizational performance (Hassan, ElBeheiry, & Hussein, 2013; Lambert & Schwieterman, 2012; Gudda & Bwisa, 2013; Khan & Khan, 2013; Arif-Uz-Zaman & Nazmul Ahsan, 2014; Xu, Wijesooriya, Wang, & Beydoun, 2011).

Hassan, ElBeheiry and Hussein (2013) reported that social responsibilities such as green supply chain greately affected supply chain performance. The findings were also affirmed by Ravi and Shankar (2015) who indicated that reverse logistics improved effectiveness and efficiency of supply chain management. However, according to Ebrahiem and Eldin (2015) only a few organizations were aware of the benefits of green supply chain and therefore only a few were keen on implementing the practice.

Cheung and To (2011) focused on customer relationship management where they found that customer satisfaction and perception of service had a positive influence on performance of organization. Similarly, Bashir, Machali and Mwinyi (2012) showed a positive relationship between service quality and customer relationship management. The studies recommended that organizations need to incorporate customer perception in product and service design so as to improve customer experience and satisfaction. Increased customer satisfaction index has shown to have an effect in the improvement of organization performance (Feng, Cai, Zhang, & Liu, 2016).

Gudda and Bwisa (2013) noted that supplier collaboration helped in product innovativeness. The findings emphasized on the need to incorporate supplier in product innovation and development. Nyamasege and Biraori (2015) further added that lack of supplier relationship management lowered supply chain management effectiveness. Mwikali and Kavale (2012) added that lack of supplier relationship management lowers profit margins in the long run.

Khan and Khan (2013) emphasized on the need for organizations to adopt outsourcing as a means of ensuring organizational success. The critical success factors in outsourcing were flexibility, trustworthy, competitive bidding, consultation and quality management were critical success factors in outsourcing. Bosire, Nyaoga, Ombati and Kongere (2013) also noted a positive relationship between outsourcing and lead time. However outsourcing was greatly affected by government policies (Magara, Oloko, & Nyangau, 2014).

Arif-Uz-Zaman and Nazmul Ahsan (2014) stressed that the performances for lean supply chain compare to non-lean situation were significantly better in cost and time competitive strategies than quality and flexibility. Dwayne Whitten, Green Jr and Zelbst (2012) elaborated that organizational performance depends on tackling agility, adaptability and alignment of supply chain. Further, Shale (2015) observed the need for organization to create a seamless flow of information so as to ensure lean practices, customer and supplier relationship as well as promote outsourcing and achievement of operational optimization and success.

2.6 Research Gaps

Various studies have been carried out to determine the effect of contemporary supply chain practices on performance (e.g. Ho, Zheng, Yildiz and Talluri, 2015; Taticchi, Tonelli, & Pasqualino, 2013; Mutunga, Magutu, & Chirchir, 2015; Muma, Nyaoga, Matwere, & Nyambega, 2014). However, most of these studies have looked into the specific processes of supply chain and how they impact performance. This leaves a gap

on the influence of contemporary supply chain practices on performance. This study therefore aims to fill this gap by determining the combined influence of these contemporary supply chain practices on performance of large manufacturing firms in Kenya and will determine the nature of influence, strength of influence and rank supply chain chain in large manufacturing firms in Kenya.

Further, most studies reviewed focused on the effect of individual practices on performance without analyzing the moderating effect of information technology thereby creating a gap that this research intends to fulfil. The introduction of a moderating variable produces a different dimension that was absent in all other studies. The moderating variable thus makes this research unique and distinct from all other studies done on contemporary supply chain practices. Specifically, the study aims at assessing whether information technology has a positive or a negative effect on the adoption of the various contemporary practices and whether the moderation affects performance.

The research also noted that most previous studies in Kenya focused on service industries (Mwikali & Kavale, 2012; Okatch, Mukulu, & Oyugi, 2011). The focus on only one sector leaves a research gap that this study wishes to fill. The study will base its findings on the large manufacturing sector so as to corroborate its findings with those of the service sector and provide a different view of the effect of supply chain contemporary practices and performance. The study will also provide a ranking on the importance and level of influence among the supply chain contemporary practices.

It is evident that most reseachers in this subject area have concentrated on the individual aspects of supply chain. However, these studies have not investigated the combined influence of these contemporary supply chain practices on performance. These studies have not researched them as contemporary practices but rather as strategies to improve supply chain management and have also not paid keen interesst in the influence that they pose on performance. The present study therefore aims to determine the influence these practices have on performance and establish their relative influence on performance.

There are also existing gaps in terms of coverage of past studies and methodologies adopted. For instance, Ebrahim and Eldin (2015) focused on supply chain practices in restraurants in Malasya. Similarly, Bashir, Machali and Mwinyi (2012) focused on microfinance institutions in Kenya. The latter confirmed the role of government in supply chain. These studies used customers as their unit of observation while the current study used key managers as the unit of observation.

2.7 Summary of Literature Reviewed

This chapter covered the theories underpinning the study which include the theory of supply chain constraints, resource based theory, value chain theory, theory of lean six sigma and the transaction theory. The chapter further looked at the relevant literature supporting the objectives of the study and the conceptual framework adopted by the study. From the gaps, it was evident that past studied have used different variables or sub-variables of contemporary supply chain as those adopted by this study. Further, most of the reviewed literature did not take into account information technology as the moderating variable. The methodologies in most studies are different adopting different research designs, populations and scopes.

The literature reviewed covered the aspects of green supply chain, customer relationship management, supplier relationship management, outsourcing practices, lean supply chain, information technology as well as performance of large manufacturing firms. The literature helped to bring out the relationship between each independent variable with the dependent variable, as well as the moderating influence of information technology. Literature has shown that there is no agreement on the relationship between contemporary supply chain practices and performance. Some scholars reviewed posit that there is a positive influence of contemporary supply chain practices on performance while others give contradicting findings.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter covered the research philosophy used in the study, research design, population of the study, sampling techniques and procedures, data collection techniques, pilot study, reliability and validity as well as data analysis and presentation. The procedures for obtaining the sample size was done as well as detailed tests that were carried out to test the hypotheses of the study. A regression model used in the study was also explained in this chapter.

3.2 Research Design

The study used a descriptive research design. This design was appropriate because the study aimed at presenting the findings of the study by observing and describing the behavior of the subjects without influencing them in any way (Garg & Kothari, 2014). Research design refers to the overall strategy chosen to integrate the different components of the study in a coherent and logical way, thereby, ensuring effective addressing of the research problem. Further, it constitutes the blueprint for the collection, measurement and analysis of data (Creswell, 2013).

Descriptive research design was also important in the study as it gave room to determine the relationship between each independent variable with the dependent variable. According to Creswell and Creswell (2017), a descriptive research design is used to determine the relationship between one thing (an independent variable) and another (a dependent or outcome variable) in a population. This helps to establish associations between the study variables as sought in this study. It also helped determine the influence the moderating variable on the relationship between the independent variables and the dependent variable.

3.2.1 Research Philosophy

Research philosophy outlines the way data of a certain phenomenon should be gathered and analyzed (Saunders & Lewis, 2014). Research philosophy also relates to the development of knowledge and the nature of that knowledge, and contains important assumptions about the way in which researchers view the world (Saunders, Lewis, & Thornhill, 2007). A paradigm is simply a belief that guides the way we do things, or more formally establishes a set of practices. This can range from thought patterns to action. There are two extreme philosophical views regarding knowledge and reality. They include positivism and phenomenology.

This study used positivism research philosophy. Positivism research philosophy reflects the belief that reality is stable. Positivist belief that hypothesis developed from existing theories can be tested by measuring observable social realities, thus positivism is derived from natural sciences. If a research philosophy reflects the principles of positivism then it tends to adopt the philosophical stance of the natural scientists (Halperin & Heath, 2012). In addition, this study's approach was based on positivism as it relied on experimental and non-manipulative methods. These ensured that there was a distance between the subjective biases of the researcher and the objective reality of the study. The positivist approach involves stating theory, hypothesis generation and testing. Quantitative methods are used in this philosophy. Positivistic thinkers adopt scientific methods and systematize the knowledge generation process with the help of quantification to enhance precision in the description of parameters and the relationship among them (Thomas, Silverman & Nelson, 2015). Positivism attempts to measure the variables of a social phenomenon through quantification (Kura & Sulaiman, 2012).

3.3 Target Population

The target population entails the entire group that a researcher is interested in studying (Fowler, 2013). The target population for the study was all the large manufacturing organizations listed by KAM. According to KAM Directory (2016), there were 563

listed large manufacturing firms in Kenya. These firms formed the target population and were the unit of analysis in the study. The unit of observation were the top key managers in any of the three key departments (procurement, operations and finance) of the large manufacturing firms listed by KAM. Therefore the targeted unit of observation was 563 key managers.

The research adopted the large manufacturing firms as listed by KAM because KAM has certain quality standards that are imposed on all its members to ensure compliance and standardization of manufacturing procedures. Therefore, all organizations registered by KAM comply with both international and local standards. The unit of observation were the top key managers who included the finance, procurement and production managers because they were familiar with the area of the study and would readily provide the data required by the study.

3.4 Sampling Frame

A sampling frame refers to a list of sampling units where the population of the study is derived from (Cochran, 2007). The sampling frame for this study was the registered organizations listed in the Kenya Association of Manufacturers directory (2016). There were 563 listed large manufacturing firms as shown in Appendix III. These firms were clustered into 14 sectors; building, mining and construction, chemical and allied, energy, electrical and electronics, food and beverage, fresh produce, leather and footwear, metal and allied, motor vehicle and accessories, paper and board, pharmaceutical and medical equipment, plastic and rubber, services and consultancy, textile and apparels and timber, wood and furniture.

3.5 Sampling Techniques and Sample Size

Sampling techniques is the process of selecting a subset of individuals from within a statistical population to estimate characteristics of the whole population (Brase & Brase, 2016). The study used stratified random sampling technique to select a sample from 563 key managers from the 563 listed large manufacturing firms in Kenya. The study

selected three senior managers from procurement, finance and operations department in each organization.

Sample size is the number of observations in a sample (Montgomery, 2017). It is a representative of the population under study such that the sample results can be inferred to the entire population. According to Garg and Kothari (2014) the sample size should be adequate and must be representative enough i.e. it should be more than 30 units except in small populations. Sampling is the process of selecting units from a population of interest so that by studying the sample we may fairly generalize our results back to the population from which they were chosen (Fowler, 2013).

The sample size was calculated using the Yamane (1967) formula as follows;

$$n=Z^2pq/d^2$$

Where,

n= desired sample size

Z= standard normal deviation set at 1.96 (95% confidence level)

P= proportion of the targeted population that have the characteristic focusing in the study estimated at 50% (0.5).

q=1-p (1-0.5)

d= degree of accuracy was set at 5%-degree proportion of error that should be accepted in the study (0.05) since the study was at 95% confidence level.

Thus desired sample (n) = $\{1.96^2*(0.5*(1-0.5)\}/0.05^2$

$$\text{Hence; } n= \frac{(1.96*1.96)*(0.5*0.5)}{(0.05*0.05)}$$

$$n = 384$$

Since the total target population was less than 10,000 the researcher applied finite correction formulae (nf) that was applied together with the Yamane formulae as used in past research on the same thematic area (Seitz, Lipcius, & Hines, 2017). The following are the successive steps.

$$nf = \frac{n}{1 + n\ /N}$$

Where: n is the sample size and N is the total target population

$$N = 563$$

n = 384

$$nf = \frac{384}{1+(384\ /\ 563)} = 312$$

The sample size for the study was therefore 312.

The study also divided the population into 14 strata based on the sectors in the large manufacturing firms and sample size per strata was as shown in Table 3.1. To identify the sample size for each stratum, the research adopted the following formula as used by Velychko (2015), a researcher in the same thematic area.

$n_i = kN_i$ hence $k = n/N = 312/563 = 0.554$ (55.4%)

Table 3.1: Sampling Table

Sector	No. of firms	Sample Size (55.4%)
Building, Mining and Construction	20	11
Chemical and Allied	70	39
Energy, Electricals and Electronics	34	19
Food and Beverage	71	39
Fresh Produce	3	2
Leather and Footwear	7	4
Metal and Allied	66	36
Motor Vehicle and Accessories	27	15
Paper and Board	63	35
Pharmaceutical and Medical Equipment	21	12
Plastic and Rubber	68	38
Services and Consultancy	61	34
Textile and Apparels	35	19
Timber, Wood and Furniture	17	9
Total	**563**	**312**

3.6 Data Collection Methods

Data collection is the process of gathering and measuring information on variables of interest, in an established systematic fashion that enables one to answer stated research questions, test hypotheses, and evaluate outcomes (Zikmund, Babin, Carr & Griffin, 2013). The study used both primary and secondary data pertaining to perfromance of large manufacturing firms. Primary data was obtained from a structured questionnaire to collect data from 312 large manufacturing firms listed by KAM. Secondary data was gathered from existing literature, periodicals, journals, government publications, financial statements and websites containing relevant information.

The study used a questionnaire to collect data. The questionnaire was organized into eight sections. The first section collected demographic data of respondents who took part in the study. The second section was structured to collect data on the influence of green supply chain on organizational performance. Section three was used to collect data on the influence of customer relationship management on organizational performance. Section four collected data on the influence of supplier relationship on organizational performance, section five collected data on the influence of outsourcing on organizational performance, section six collected data on the influence of lean supply chain on organizational performance, section seven collected data on the moderating effect of information technology on organizational performance and section eight collected data on the performance of the organizations.

The questionnaires were self administered. The researcher made use of research assistants who were adequately trained prior to questionnaire administration. The ethical considerations such as confidentiality of the respondents were observed during data collection process. Before actual data collection, the researcher obtained an introduction letter from Jomo Kenyatta University of Agriculture and Technology. The researcher also obtained a research permit from the National Comission for Science,Technology and Innovation (NACOSTI). A cover letter explaining the aim of the study were attached to the questionnaire prior to data collection.

3.7 Pilot Study

Pilot studies are important in detecting ambiguity, evaluating the type of answers given to determine whether they help the researcher to achieve the laid down objectives (Viechtbauer, et al., 2015). According to Mugenda (2013) reported that a pilot sample should be between 1% and 10% depending on the sample size. Therefore the study did a pilot study on 10% of the sample i.e. conducted a pilot on 31 large manufacturing firms listed by KAM. The respondents taking part in the pilot study were not used in the actual data collection. The pilot test results were used to adjust the questionnaire accordingly before actual data collection.

3.7.1 Reliability

Reliability is the degree at which results obtained from a study are consistent after interpreted number of times. Similarly, reliability in every research gives the same results on frequent assessment from an experiment or test by using similar methodology (Hakansson, 2013). Reliability in research is influenced by the degree of error. As random error increases, reliability decreases (Mugenda, 2013). In order for results to be usable in further research steps they must be reliable and valid.

Cronbach's Alpha is a popular method for estimating the reliability of an instrument but it is highly inappropriate for the survey questionnaires. It is further stated that estimating the amount of error is different for different measuring instruments and for different situations hence Cronbach's Alpha is used to establish the reliability of scores on a psychometric instrument (Bonett & Wright, 2015). Cronbach's Alpha determines the internal consistency reliability of test scores such that the more the research item scores are in agreement with the total scores, the more reliable the test is. The Cronbach Alpha coefficient is denoted by 'r' which gives a range of 0-1. A Cronbach alpha of greater than 0.7 indicated that that the tools were reliable (Nguyen & Nguyen, 2017; Li, Wu, Holsapple, & Goldsby, 2017).

3.7.2 Validity

Validity in research is defined as how well a scientific test or piece of research actually measures what it sets out to, or how well it reflects the reality it claims to represent (Cohen, Manion, & Morrison, 2013). The researcher gave the data collection tool to the experts in the supply chain professionals and other senior management staff in organizations who also recommended areas to be included in the study. This ensured that the data collection instrument covered all the areas that were intended to be covered by the study. The study also determined criterion-related validity where the findings of the study were correlated with other studies in the same subject area.

3.8 Data Analysis and Presentation

The data in the study were obtained from both primary and secondary sources. The main data collection source was primary data obtained using a questionnaire. The questionnaire only collected quantitative data obtained from closed questions. The data collected was cleaned, coded then entered into SPSS for analysis. Secondary data collected from periodicals, journals, books, financial statements and government archives were reviewed in the literature.

Quantitative data obtained from the questionnaire was analyzed through descriptive and inferential statistics (Suen & Ary, 2014). Descriptive statistics involved use of measures of central tendency which included the mean, standard deviations, maximum and minimum values and variances. The results were presented using tables, pie charts, column charts and bar charts. The purpose of descriptive statistics were to provide simple summaries about the measures in the study (Sathianandan, Safeena, & Rahman, 2017).

Correlations were done to determine the degree of the relationship between these variables using the Pearson Product-Moment Correlation and therefore ranking was done to determine which independent variable has a strong influence on organization performance (Cohen, Cohen, West & Aiken, 2013). The correlation coefficient ranges from -1.0 to +1.0 and the closer the coefficient is to +1 or -1, the more closely the two variables are related (Cohen, Cohen, West & Aiken, 2013). The strength of the correlation is measured based on the Pearson correlation scale where, if the correlation coefficient is positive and close to one, the variables are said to be strongly and positively correlated and vice versa. Correlations was done using a 1-tailed test, setting the significance value at 0.05. Values smaller than the significance value (0.05) were to be deemed as significant while those values greater than 0.05 were said to be insignificant.

Regression analysis was used to determine the strength of the relationship between the dependent variable (usually denoted by Y) and the independent variables (denoted as X).

The strength and reliability of the regression model was determined using the coefficient of determination (R^2) and F-test. The R^2 value of 0% indicates that the model explains none of the variability of the response data around its mean. 100% indicates that the model explains all the variability of the response data around its mean (Zikmund, Babin, Carr, & Griffin, 2013). The study used ANOVA to determine whether the regression model was reliable or not. Similarly, the study compared the F-value with the overall significance level to determine if the hypotheses are significant or not.

The regression was conducted using a multistage analysis which involved first running the R^2 and F-test without the moderator while the second stage involved running the tests with the moderator included. The purpose was to compare the changes in R^2 value and F-value to determine the effect of the moderator in the relationship between independent variables and the dependent variable. Presence of a significant difference would indicate significant effect of the moderator.

Hypotheses in the study was tested using beta, t and p values. The test was done at 95% confidence level, 1 tailed test. This implied that the significance value was set at 0.05. The values less than 0.05 were deemed as significant while those greater than the significance value were deemed to be insignificant (Yin, 2011). The beta value was used to indicate the direction and strength of the relationship between each independent variable and the dependent variable. A positive beta coefficient indicated a positive relationship between the variables and vice versa. The study also compared the t-tabulated with the t-statistic which was set at 1.96. T values that were more than the t-statistic were considered statistically significant and vice versa (Harrell, 2015).

Further, the study conducted a multistage analysis to determine the effect of the moderator on the relationship between each of the independent variable and the organizational performance. To do this, the study first run the beta, t and p values without the moderator and consequently with the moderator and compare their outcomes. The purpose was to compare if there was a significant change in the values,

so as to assess the effect of the moderator on the relationship between each of the independent variables and the dependent variable (Yin, 2011).

3.8.1 Statistical Modelling

Statistical modelling involves making judgments of the probability that an observed difference between groups is a dependable one or one that might have happened by chance in the study (Harrell, 2015). The dependent variable in the study was organizational performance while the independent variables were green supply chain, supplier relationship, customer relationship management, outsourcing and lean supply chain. Inferential statistics was analyzed using correlation and regression.

The study applied ordinary least square models (OLS) and moderated multiple regression models (MMR) to illustrate the relationship of each independent variable with the dependent variable (Wang, Gunasekaran, Ngai & Papadopoulos, 2016; Liu, Prajogo & Oke, 2016). The models were modelled in a multi stage fashion. The first model was an ordinary least square model (OLS) which exhibited the effect of each independent variable with organizational performance without involving the moderator as well as their combined effect on organizational performance as depicted by regression model (i).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \varepsilon \quad \text{(i)}$$

Where; Y is Organizational Performance

β_0 is the constant

$\beta_1 - \beta_5$ are the coefficients of the independent variables

$X_1 - X_5$ are Green Supply Chain, Customer relationship management, Supplier Relationship, Outsourcing and Lean Supply Chain respectively.

ε is the error term

The second model was obtained when information technology was added as a variable to obtain the combined effect of contemporary supply chain practices and information technology as depicted in model (ii).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 Z + \varepsilon \quad \text{(ii)}$$

Where; Y is Organizational Performance

β_0 is the constant

$\beta_1 - \beta_5$ are the coefficients of the independent variables

$X_1 - X_5$ are Green Supply Chain, Customer relationship management, Supplier Relationship, Outsourcing and Lean Supply Chain respectively.

Z is the moderator (Information Technology)

ε is the error term

The third model was obtained to show the moderation effect of information technology on the relationship between contemporary supply chain practices and performance. This was done through analyzing the interaction effect of the practices with the moderator as shown in model (iii).

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_1 X_1 * Z + \beta_2 X_2 * Z + \beta_3 X_3 * Z + \beta_4 X_4 * Z + \beta_5 X_5 * Z + \varepsilon \quad \text{(iii)}$$

Where; Y is Organizational Performance

β_0 is the constant

$\beta_1 - \beta_5$ are the coefficients of the independent variables

$X_1 - X_5$ are Green Supply Chain, Customer relationship management, Supplier Relationship, Outsourcing and Lean Supply Chain respectively.

Z is the moderator (Information Technology) and ε is the error term.

3.8.2 Diagnostic Tests

Statistical assumption tests are diagnostic tests meant to reduce the probability of Type I and Type II errors and improve accuracy of estimates (Harrell, 2015). The tests include factor analysis, linearity, normality tests, heteroscedasticity test and multicollinearity. The study conducted all the above tests to determine if the data collected were accurate, reliable, valid and capable of inferring the study results to the population.

Factor analysis is a process in which sampled data is expressed as a function of a number of possible causes in order to find the most important (Brockwell & Davis, 2016). The study conducted exploratory factor analysis (EFA) to uncover the underlying structure of relatively large set of variables. EFA is a technique within factor analysis whose overarching goal is to identify the underlying relationships between measured variables (Brown, 2014). EFA was done using the Kaiser-Meyer-Olkin (KMO) and for Sampling, Adequacy Bartlett's Test of Sphericity was carried out.

KMO & Bartlett's test play an important role for accepting the sample adequacy. While the KMO ranges from 0 to 1, the world-over accepted index is over 0.6. The study adopted this test index as used by other scholars e.g. Chaudhary and Chanda (2015) and Anne, Nicholas, Gicuru, and Bula (2016). The Bartlett's Test of Sphericity relates to the significance of the study and thereby shows the validity and suitability of the responses collected to the problem being addressed through the study (Brown, 2014). For Factor Analysis to be recommended suitable, the Bartlett's Test of Sphericity must be less than 0.05 (Quach, Vo, & Pham, 2016). In addition, for factor loadings that were insignificant, the study dropped them before regression analysis was conducted.

Linearity test determines whether there is a significant relationship between the dependent and each of the independent variables and whether the relationship is linear or not (Hahs-Vaughn, 2016). The study adopted Durbin -Watson statistic as applied by Rayner, Best, Brockhoff and Rayner (2016), a scholar in the same thematic area. The

study adopted a significant deviation of greater than 0.05 to imply that the relationship between the independent variable is linearly dependent and vice versa (Draper & Smith, 2014).

Normality test as a statistical assumption test is aimed at determining if the data set is well-modeled by a normal distribution using Shapiro–Wilk test and Kolmogorov Tests (Adhikari, 2014). The study conducted normality test at 95% confidence interval for mean where the p-value was compared to determine whether to reject the null hypothesis meaning that data was either normally distributed (greater than 0.05)or not (less than 0.05). (Corder & Foreman, 2014; Osoro, Muturi and Ngugi, 2016 and Farah, 2015).

Homoscedasticity test was carried out to determine the circumstance in which the variability of a variable is equal across the range of values of a second variable that predicts it (Asma'Mustafa & Ismail, 2016). This was achieved through use of homogeneity tests. When the level of significance associated with Levene statistic is more than 0.05 at 5% significance level, then the variances are homogenous (Paulraj & Blome, 2017; Chebolu-Subramanian & Gaukler, 2014).

Multicollinearity is a statistical assumption test which is usually done in a multiple regression model to determine if variables are highly correlated, meaning that one can be linearly predicted from the others with a substantial degree of accuracy (Cohen, Cohen, West & Aiken, 2013). Multicollinearity in the study was determined using the variance inflation factors (VIF) and tolerance values. The parameters of VIF value of between 1 and 10, usually shows that there are no multicollinearity issues in the data while VIF value of greater than 10 or less than 1, indicate presence of multicollinearity issues (Ray-Mukherjee *et al*., 2014) (Wiengarten, Humphreys, Gimenez & McIvor, 2016; Oke, Prajogo & Jayaram, 2013).

3.9 Ethical Issues

The study encountered ethical issues during data collection. The issues included demand by the manufacturing firms' personnel to provide an introduction letter and other authorizations such as NACOSTI before providing the information required. The researcher therefore provided the documents as required. Further, majority of the respondents were skeptical in providing confidential information. However, they were assured of their confidentiality which was also indicated in the introduction letter. A cover letter explaining the aim of the study was attached to the questionnaire prior to data collection. Additionally, some respondents were hostile, unresponsive and denied the research assistants required access to information. The researcher went to more friendly and cooperative firms

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

The chapter presents the results that were collected from the managers of large manufacturing firms listed by KAM in Kenya. Data in the study has been analyzed using both descriptive and inferential statistics. The analysis has been done based on the objectives of the study for each descriptive and inferential analysis. The response rate, reliability and general information has been done in the first part of analysis followed by analysis by objectives. The order of analysis was as follows; response rate, reliability findings, demographics, descriptive analysis and finally inferential analysis.

4.2 Response Rate

The study sought to collect data from 312 managers in the large manufacturing firms listed by KAM in Kenya. However, the study did not realize 100% response as there were non-response incidences during data collection. Therefore, out of the targeted 312 managers, 264 gave adequate information required for analysis. The study hence realized a response rate of 84% as shown in Figure 4.1. This response rate is good in accordance to Garg and Kothari (2014) who posited that a response rate of more than 70% is good to conduct data analysis.

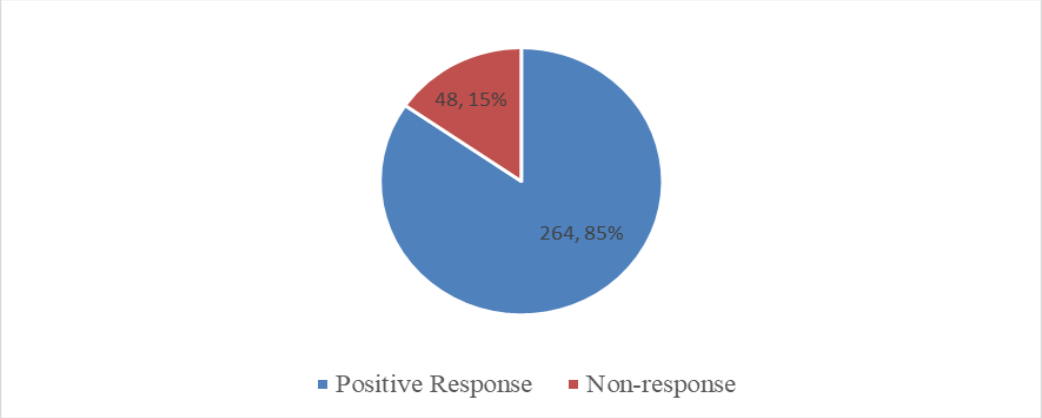

Figure 4.1: Response Rate

4.3 Pilot Study Results

The research conducted a pilot study on 10% of the sample i.e. a pilot on 30 managers of large manufacturing firms listed by KAM. The pilot consisted of reliability findings, factor analysis done using Kaiser-Meyer-Olkin Measure of Sampling Adequacy (KMO) and Bartlett's Test of Sphericity, total variances explained (TVE) scree plots and component matrices, and multicollinearity using variance inflation factors and tolerance values. The section was organized into three sub-sections consisting of data reliability, factor analysis and multicollinearity.

4.3.1 Reliability

Cronbach's Alpha was used to test for reliability of the data collection instruments. The Cronbach Alpha coefficient was interpreted as follows; >0.9 – Excellent, >0.8 – Good, >0.7 – Acceptable, >0.6 – Questionable, >0.5 – Poor and <0.5 – Unacceptable. SPSS Version 21 was used to analyze the study findings. The study determined that the questionnaire was by and large reliable as a Cronbach Alpha coefficient of 0.979 was obtained for the 54 items of the questionnaire. The reliability findings were in line with scholars in the same subject such as Nguyen & Nguyen (2017) and Li, Wu, Holsapple

and Goldsby (2017) whose studies realized Cronbach coefficient of more than 0.7. The findings of the study are shown inTable 4.1.

Table 4.1: Reliability Results

Construct	No of Items	Cronbach Alpha
Green Supply Chain	9	.891
Customer relationship management	9	.790
Supplier Relationship Management	9	.920
Outsourcing	9	.918
Lean supply chain	9	.954
Information technology	9	.802
Overall Cronbach	**54**	**.979**

4.3.2 Factor Analysis

The study conducted exploratory factor analysis (EFA) to uncover the underlying structure of relatively large set of variables. EFA was done using the Kaiser-Meyer-Olkin (KMO) and for Sampling, Adequacy Bartlett's Test of Sphericity was carried out. KMO & Bartlett's test play an important role for accepting the sample adequacy. While the KMO ranges from 0 to 1, the world-over accepted index is over 0.6. For Factor Analysis to be recommended suitable, the Bartlett's Test of Sphericity must be less than 0.05.

The study found that green supply chain had a KMO value of 0.630 and Bartlett's test, $x2(36, N = 264) = 1935.747$, $p = .000$. The test results indicate that green supply chain met KMO threshold of 0.6 and Bartlett's Test of Sphericity threshold of <0.05. The study therefore concludes sampling was adequate for green supply chain variable. The findings are shown in Table 4.2. Factor loading analysis was conducted to determine the number of variables that were retained. It was found that the first two factor had Eigenvalues of more than 1 representing 75.352% of the total variance explained while the remaining seven factors had Eigen values of less than 1. Further, the first factor

accounts for 59.803% of the variance in green supply chain and the second factor accounts for 15.549% of the variance. All the remaining factors were found to be insignificant and therefore were dropped. The findings are shown in Appendix IV. The study finally sought to determine the factor loadings for green supply chain. The findings obtained indicate that "The organization is able to generate energy from its waste products" had the highest factor loading in the first component with 0.905 while "All electrical equipment and tools are energy efficient" had the highest factor loading in the second component with 0.886 as shown in Appendix V.

The study also conducted factor analysis for customer relationship management and obtained a KMO value of 0.620 and Bartlett's test, $x2(36, N = 264) = 1820.789$, $p = .000$. The test results indicated that customer relationship management met KMO threshold of 0.6 and Bartlett's Test of Sphericity threshold of <0.05. The study therefore concludes sampling was adequate for customer relationship management variable. The findings are shown in Table 4.2. Upon conducting the factor loading analysis, the study found that the first three factors had Eigenvalues of more than 1 representing 76.641% of the total variance explained while the remaining six factors had Eigenvalues of less than 1. Further, the first factor accounts for 43.710% of the variance in customer relationship management, the second factor accounts for 20.878% of the variance and the third factor accounts for 12.055% of the variance in customer relationship management. All the remaining factors were found to be insignificant and therefore were dropped. The findings are shown in Appendix IV. Further, the factor loadings for customer relationship management indicated that "The organization incorporates views of customers concerning its products" had the highest factor loading in the first component with 0.857, "The products are well marketed using all forms of media" had the highest factor loading in the second component of 0.821 while "The products are widely available to customers" had the highest factor loading in the third component with 0.626 as shown in Appendix V.

Factor analysis for supplier relationship management was done where a KMO value of 0.730 and Bartlett's test, $x2(36, N = 264) = 1594.883$, $p = .000$ was obtained. The test

results indicated that supplier relationship management met KMO threshold of 0.6 and Bartlett's Test of Sphericity threshold of <0.05. The study therefore concludes sampling was adequate for supplier relationship management variable. The findings are shown in Table 4.2. From total variance explained table shown in Appendix IV, it was found that the first two factors had Eigenvalues of more than 1 representing 66.689% of the total variance explained while the remaining seven factors had Eigenvalues of less than 1. Further, the first factor accounts for 54.972% of the variance in supplier relationship management and the second factor accounts for 11.717% of the variance. All the remaining factors were found to be insignificant and therefore were dropped. The study sought to determine the factor loadings for supplier relationship management. The findings obtained indicate that "The suppliers are involved in product developments" had the highest factor loading in the first component with 0.877, and "The organization holds regular meetings with its suppliers" had the highest factor loading in the second component of 0.637 as shown in Appendix V.

Factor analysis findings on outsourcing variable indicated that a KMO value of 0.620 and Bartlett's test, $x2(36, N = 264) = 1159.135$, $p = .000$ was obtained. The test results indicated that outsourcing met KMO threshold of 0.6 and Bartlett's Test of Sphericity threshold of <0.05. The study therefore concludes sampling was adequate for outsourcing variable. The findings are shown in Table 4.5. The study also found that the first two factors had Eigenvalues of more than 1 representing 63.235% of the total variance explained while the remaining seven factors had Eigenvalues of less than 1. Further, the first factor accounts for 42.376% of the variance in outsourcing and the second factor accounts for 20.859% of the variance. All the remaining factors were found to be insignificant and therefore were dropped. The findings are shown in Appendix IV. The study sought to determine the factor loadings for outsourcing. The findings obtained indicate that "There are formal standards of outsourcing services across the organization" had the highest factor loading in the first component with 0.819, and "The organization collaborates well with its outsourced partners" had the highest factor loading in the second component of 0.639 as shown in Appendix V.

The study conducted factor analysis on lean supply chain and found a KMO value of 0.720 and Bartlett's test, *x2*(36, *N* = 264) = 1337.350, *p* = .000. The test results indicated that lean supply chain met KMO threshold of 0.6 and Bartlett's Test of Sphericity threshold of <0.05. The study therefore concludes sampling was adequate for lean supply chain variable. The findings are shown in Table 4.2. The study further conducted the factor loading analysis to determine the number of variables that were retained. The study found that the first two factors had Eigenvalues of more than 1 representing 70.167% of the total variance explained while the remaining seven factors had Eigenvalues of less than 1. Further, the first factor accounts for 58.420% of the variance in lean supply chain and the second factor accounts for 11.747% of the variance. All the remaining factors were found to be insignificant and therefore were dropped. The findings are shown in Appendix IV. The study sought to determine the factor loadings for lean supply chain. The findings obtained indicate that "The organization produces high quality products to avoid returns" had the highest factor loading in the first component with 0.908, and "There is minimization of wastage in the organization" had the highest factor loading in the second component of 0.671 as shown in Appendix V.

The study finally conducted factor analysis on information technology and found a KMO value of 0.693 and Bartlett's test, x2(36, N = 264) = 1202.950, p = .000. The test results indicated that information technology met KMO threshold of 0.6 and Bartlett's Test of Sphericity threshold of <0.05. The study therefore concludes sampling was adequate for information technology (moderating) variable. The findings are shown in Table 4.2. The study further conducted the factor loading analysis to determine the number of variables that were retained. The study found that the first three factors had Eigenvalues of more than 1 representing 75.099% of the total variance explained while the remaining seven factors had Eigenvalues of less than 1. The findings are shown in Appendix IV.

Table 4.2: KMO and Bartlett's Tests

KMO and Bartlett's Test for Green Supply Chain		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.630
Bartlett's Test of Sphericity	Approx. Chi-Square	1935.747
	df	36
	Sig.	.000
KMO and Bartlett's Test for Customer relationship management		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.620
Bartlett's Test of Sphericity	Approx. Chi-Square	1820.789
	Df	36
	Sig.	.000
KMO and Bartlett's Test for Supplier Relationship Management		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.730
Bartlett's Test of Sphericity	Approx. Chi-Square	1594.883
	Df	36
	Sig.	.000
KMO and Bartlett's Test for Outsourcing		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.620
Bartlett's Test of Sphericity	Approx. Chi-Square	1159.135
	Df	36
	Sig.	.000
KMO and Bartlett's Test for Lean Supply Chain		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.720
Bartlett's Test of Sphericity	Approx. Chi-Square	1337.350
	Df	36
	Sig.	.000
KMO and Bartlett's Test for Information Technology		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.693
Bartlett's Test of Sphericity	Approx. Chi-Square	1202.950
	Df	36
	Sig.	.000

4.3.3 Multicollinearity Test

Multicollinearity in the study was determined using the variance inflation factors (VIF) and tolerance values. The parameters of VIF value of between 1 and 10, usually shows that there are no multicollinearity issues in the data while VIF value of greater than 10 or less than 1, indicate presence of multicollinearity issues. The study found out that all contemporary supply chain practices had VIF values of between 1 and 10. Green supply chain had VIF value of 1.533, customer relationship management had VIF value of 1.641, supplier relationship management had VIF value of 1.375, outsourcing had VIF value of 1.514 and lean supply chain had VIF value of 1.372. The findings are indicated in Table 4.3.

Table 4.3: Multicollinearity Test

	Collinearity Statistics	
	Tolerance	VIF
Green Supply Chain	.652	1.533
Customer relationship management	.609	1.641
Supplier Relationship Management	.727	1.375
Outsourcing	.660	1.514
Lean Supply Chain	.729	1.372

4.4 Demographic Information

The study sought to determine the general characteristics of the respondents who participated in the study. The general information sought was the designation of the managers and the way the operation in the firms were carried out. The findings are presented in this section. The demographic information was sought in order to assist the researcher in determining whether the respondents of the study were a representative sample of the target population for generalization purposes.

4.4.1 Designation of Managers

The study sought to determine the designation of the respondents of the study in order to determine the type of managers who participated in the study. The findings of the study indicate 68% of the respondents were procurement managers while finance and operations mangers tied at 16% as indicated in Figure 4.2. The study used designation of managers in the procurement, finance and production departments to obtain information related to supply chain because they were knowledgeable in the subject area line with other scholars in such as Magutu, Aduda and Nyaoga (2015) and Ye, Zhao, Prahinski and Li (2013).

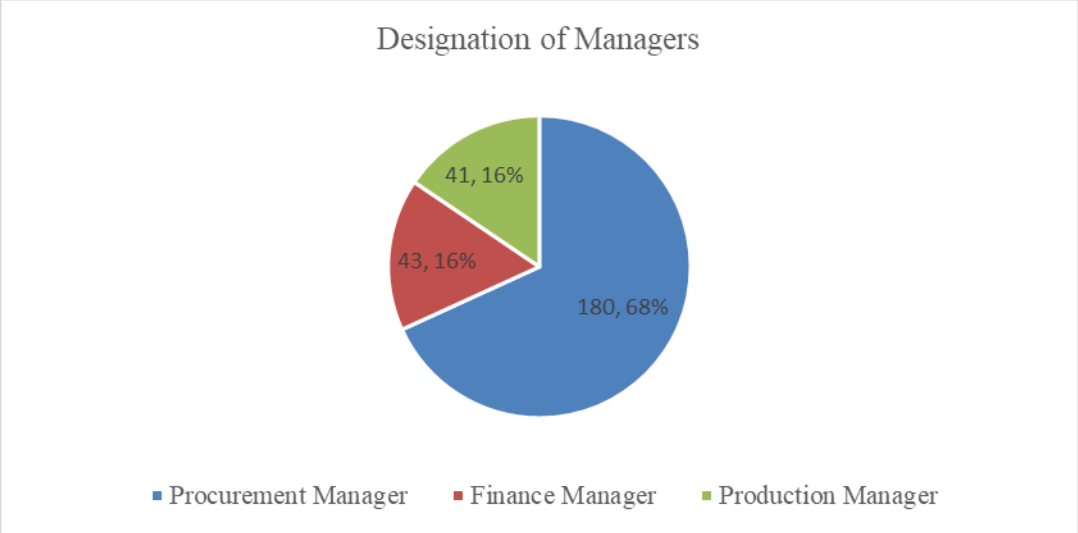

Figure 4.2: Designation of Managers

4.4.2 Operations Automation in the Firms

The study also sought to determine how the large manufacturing carried out their operations. The findings of the study indicated that 61% of the firms used semi-automated operations, 28% used fully automated operations and 11% used manual types of operations. The findings on operations automation are shown in Figure 4.3. The study

used automation to determine the level of skills and use of technology in the large manufacturing firms as postulated by Mathur, Dangayach, Mittal and Sharma (2011).

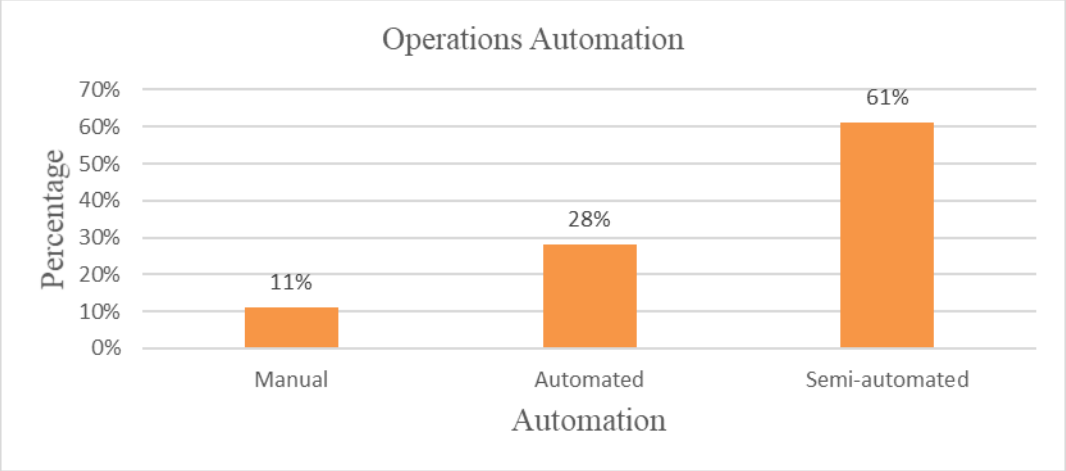

Figure 4.3: Automation of Operations

4.5 Descriptive Findings

The main objective of the study was to determine the influence of contemporary supply chain practices on performance of large manufacturing firms in Kenya. Descriptive statistics in this study were done using measures of central tendency which included the mean, standard deviations, maximum and minimum values and variances. The results were presented in line with the objectives of the study and presented using tables. The findings on descriptive were further corroborated with previous findings as discussed in the literature review.

4.5.1 Influence of Green Supply Chain Practices on Performance

The study sought to determine the influence of green supply chain practices on performance of large manufacturing firms. Means, standard deviations and variances were used to give the findings under this objective. The means were interpreted as

follows; A mean value of 0-1 implied the majority of the respondents agreed to the statements to a very small extent, a mean value of 1.1-2.0 implied the respondents agreed with the statements to a small extent, a mean value of 2.1-3.0 implied the respondents neither agreed nor disagreed with the statements, a mean value of 3.1-4.0 means that the respondents agreed to the statements to a great extent and a mean of 4.1-5.0 implied the respondents agreed with the statements to a very great extent.

The findings indicate that the mean values obtained for the majority of the items were above 3.0 indicating that the majority of the respondents agreed with the statements. The standard deviations and variance for all items was more than 1.0 indicating that the responses were varied across the means obtained. The findings of the study indicated the respondents agreed that organizations had put in place a waste management policies (*M* = 3.82, *SD* = 1.176) and that were architectural designs of the firm which allowed natural lighting (*M* = 3.89, *SD* = 1.061). However, the respondents neither agreed nor disagreed that the organizations were able to generate energy from its waste products (*M* = 2.73, *SD* = 1.529). The findings are shown in Table 4.4.

The findings of the study are in line with those earlier posited by Ravi and Shankar (2015) who found that reverse logistics is one of the most important strategic management decisions that can assist organization improve its productivity. In addition, the findings align with those of Ye, Zhao, Prahinski and Li (2013) found that some of their customers returned products purchased and therefore reverse logistics was viewed as a critical process by organizations so as to improve performance. However, the present study findings disagree with the findings of Ebrahiem and Eldin (2015) who found that only a few operators were aware of the waste management practices.

Table 4.4: Influence of Green Supply Chain Practices on Performance

	N	Mean	Std. Deviation	Variance
The organization has a recycling plant to maximize on its by-products	264	3.57	1.312	1.721
The organization has an efficient reverse logistic management system.	264	3.55	1.129	1.275
There is a waste management policy in the organization	245	3.82	1.176	1.383
The organization uses returnable containers for distribution of the products.	264	3.67	1.138	1.295
The packaging materials used are biodegradable	242	3.30	1.044	1.090
The organization has a treatment plant for waste management	235	3.53	1.381	1.908
The architectural design of the firm allows natural lighting	264	3.89	1.061	1.125
The organization is able to generate energy from its waste products	245	2.73	1.529	2.339
All electrical equipment and tools are energy efficient	264	3.23	1.136	1.291

4.5.2 Influence of Customer relationship management on Performance

The influence of customer relationship management on the performance of large manufacturing firms listed by KAM was sought in the study. Means and standard deviations were used to give the findings under this objective. The means were interpreted as follows; A mean value of 0-1 implied the majority of the respondents agreed to the statements to a very small extent, a mean value of 1.1-2.0 implied the respondents agreed with the statements to a small extent, a mean value of 2.1-3.0 implied the respondents neither agreed nor disagreed with the statements, a mean value

of 3.1-4.0 means that the respondents agreed to the statements to a great extent and a mean of 4.1-5.0 implied the respondents agreed with the statements to a very great extent.

The findings obtained on the influence of customer relationship management on performance indicate that the mean value for all items was above 3.0 implying that most respondents agreed to the statements to a great and very great extents. The findings indicated the majority of the respondents strongly agreed that the organization exchanges information with its customers (M = 4.42, SD = 1.371); customer involvement has helped in product marketing (M = 4.08, SD = 0.983); the products are widely available to customers (M = 4.36, SD = 0.654); and that the organization incorporates views of customers concerning its products (M = 4.05, SD = 0.897). These findings are shown in Table 4.5.

The findings of this study supports the argument by Ulaga and Loveland (2014) who established that in order to enable organisations to become more efficient and effective in delivering products and services to customers, knowledge on firms' customers needed to be managed to ensure that the services that were provided by the organizations were those that addressed customer needs. Further, these findings agree with Feng, Cai, Zhang and Liu (2016) findings which indicated there was an influence of information technology on the between customer involvement and performance.

Table 4.5: Influence of Customer relationship management on Performance

	N	Mean	Std. Deviation
The organization exchanges information with its customers	264	4.42	1.371
Customer involvement has helped in product marketing	264	4.08	.983
The organization involves customers during its product development	264	3.49	1.013
The products are widely available to customers	264	4.36	.654
The organization has developed training programs for its customers	251	3.69	1.066
The products are well marketed using all forms of media	264	3.99	1.113
The organization incorporates views of customers concerning its products	264	4.05	.897
There is a formal communication department to address customer issues	264	3.97	.972
The organization carries out regular customer satisfaction surveys	264	4.00	1.017

4.5.3 Influence of Supplier Relationship Management on Performance

The researcher sought to assess the influence of supplier relationship management on the performance of the large manufacturing firms using means and standard deviations. The means were interpreted as follows; a mean value of 0-1 implied the majority of the respondents agreed to the statements to a very small extent, a mean value of 1.1-2.0 implied the respondents agreed with the statements to a small extent, a mean value of 2.1-3.0 implied the respondents neither agreed nor disagreed with the statements, a mean value of 3.1-4.0 means that the respondents agreed to the statements to a great extent and a mean of 4.1-5.0 implied the respondents agreed with the statements to a very great extent.

The findings obtained on customer relationship management indicate that strongly agreed that the organizations had long term contracts with their main suppliers (M = 4.26, SD = 0.838). The respondents also agreed that supplier relationship has helped in

improving procurement management (*M* = 3.69, *SD* = 1.072); the organization ensured that its suppliers have the right capacity (*M* = 3.72, *SD* = 1.013); the organization shared information with its suppliers (*M* = 3.41, *SD* = 1.049); and that the organizations held regular meetings with their suppliers (*M* = 3.39, *SD* = 0.973). The respondents neither agreed nor disagreed that the organizations rewarded best performing suppliers (*M* = 2.81, *SD* = 1.062) and that organizations trained their suppliers (*M* = 2.99, *SD* = 0.957). The findings are shown in Table 4.6.

The findings of this study concur with those of Shukla (2016) who argued that identifying suppliers, soliciting information from suppliers, setting contract terms, negotiating with suppliers, and evaluating suppliers were important components in supplier relationship management. In addition, Nyamasege and Biraori (2015) agreed with the findings otained in this study when the authors determined that lack of supplier relationship management strategies lowered the effectiveness of supply chain management functions.

Table 4.6: Influence of Supplier Relationship Management on Performance

	N	Mean	Std. Deviation
The organization has long term contracts with its main suppliers	264	4.26	.838
The suppliers are involved in product developments	264	3.05	1.397
The organization shares information with its suppliers	264	3.41	1.049
The organization trains its suppliers	264	2.99	.957
The organization holds regular meetings with its suppliers	264	3.39	.973
The organization rewards best performing suppliers	264	2.81	1.062
The organization considers views of their suppliers	264	3.30	.933
The organization ensures that its suppliers have the right capacity	264	3.72	1.013
Supplier relationship has helped in improving procurement management	264	3.69	1.072

4.5.4 Influence of Outsourcing on Performance of Large manufacturing Firms

The study also sought to determine the influence of outsourced services on the performance of large manufacturing firms listed by KAM. Means and standard were used to descriptively analyze the findings. The means were interpreted as follows; a mean value of 0-1 implied the majority of the respondents agreed to the statements to a very small extent, a mean value of 1.1-2.0 implied the respondents agreed with the statements to a small extent, a mean value of 2.1-3.0 implied the respondents neither agreed nor disagreed with the statements, a mean value of 3.1-4.0 means that the respondents agreed to the statements to a great extent and a mean of 4.1-5.0 implied the respondents agreed with the statements to a very great extent.

The findings obtained on the influence of outsourcing on performance indicate that the mean value for all items was above 3.0 implying that most respondents agreed to the statements to a great and very great extents. The findings obtained indicated that majority of the respondents strongly agreed that the organizations had saved costs through outsourcing (M = 4.18, SD = 0.748); the organization is satisfied with its outsourced services (M = 4.03, SD = 0.610) and the organization has formal contract with its outsourced partners (M = 4.09, SD = 0.679). The respondents also agreed that the organization frequently evaluated services from outsourced partners (M = 3.89, SD = 0.828); the organization collaborated well with its outsourced partners (M = 3.87, SD = 0.702) and there were formal standards of outsourcing services across the organization (M = 3.78, SD = 0.931). The findings are presented in Table 4.7.

The study findings are supported by the fndings of Khan and Khan (2013) who revealed that contract flexibility, trustworthy relationship management, competitive bidding, consultation and negotiation and quality management were considered as the critical success factors for outsourcing in organisations. Further, Nyaboke, Amemba and Osoro (2013) agrees with the findings of the study when they concluded that to realize a competitive advantage from outsourcing rigorous supplier selection, contract negotiation and proper contract management were needed.

Table 4.7: Influence of Outsourcing on Performance

	N	Mean	Std. Deviation
The organization has saved costs through outsourcing	264	4.18	.748
The outsourced organization are efficient	264	3.80	.810
The organization is satisfied with its outsourced services	264	4.03	.610
The organization has formal contract with its outsourced partners	253	4.09	.679
The organization frequently evaluates services from outsourced partners	245	3.89	.828
There are formal standards of outsourcing services across the organization	264	3.78	.931
The organization rewards best performing outsourced organization	264	3.35	1.186
The organization collaborates well with its outsourced partners	264	3.87	.702
The organization holds mandatory supplier visits before outsourcing	264	3.34	1.140

4.5.5 Influence of Lean Supply Chain on Performance

The influence of lean supply chain on performance of large manufacturing firms listed by KAM was sought in the study using means and standard deviations. Means and standard were used to descriptively analyze the findings. The means were interpreted as follows; a mean value of 0-1 implied the majority of the respondents agreed to the statements to a very small extent, a mean value of 1.1-2.0 implied the respondents agreed with the statements to a small extent, a mean value of 2.1-3.0 implied the respondents neither agreed nor disagreed with the statements, a mean value of 3.1-4.0

means that the respondents agreed to the statements to a great extent and a mean of 4.1-5.0 implied the respondents agreed with the statements to a very great extent.

The findings indicate that the mean values obtained for the majority of the items were above 3.0 indicating that the majority of the respondents agreed with the statements. The findings indicated that the majority of the respondents strongly agreed that the organization produced high quality products to avoid returns (M = 4.15, SD = 0.800); there was minimization of wastage in the organization (M = 4.06, SD = 0.900) and that the firms ensured all products produced satisfied the customer demands (M = 4.02, SD = 0.585). The respondents also agreed that the organizations produced products that were on high demand (M = 3.93, SD = 0.707); the organizations ensured minimal wastes in their operations processes (M = 3.83, SD = 0.617); the organizations had an efficient logistics system (M = 3.89, SD = 0.895) and that the organization had streamlined their production and operational processes (M = 3.50, SD = 0.859). The findings are as shown in Table 4.8.

The findings of the study disagree with the findings of Arif-Uz-Zaman and Nazmul Ahsan (2014) who determined that that the performances for lean supply chain compare to non-lean situation were significantly better in cost and time competitive strategies than quality and flexibility. This study found that quality was important factor in lean supply chain. The findings however agree with the findings of Fullerton, Kennedy and Widener (2014) who observed that lean large manufacturing practices are directly related to operations performance. More importantly, lean large manufacturing practices also indirectly affect operations performance.

Table 4.8: Influence of Lean Supply Chain on Performance

	N	Mean	Std. Dev.
The organization practices Just in Time (JIT) procurement	264	3.37	1.140
The organization produces products that are on high demand	264	3.93	.707
There is minimization of wastage in the organization	264	4.06	.900
JIT has improved performance of the organization	264	3.60	1.095
The organization has an efficient logistics system	245	3.89	.895
The organization has streamlined its production and operational processes	235	3.50	.859
The organization ensures minimal wastes in its operations processes	264	3.83	.617
The organization produces high quality products to avoid returns	247	4.15	.800
The firm ensures all products produced satisfy the customer demands	264	4.02	.585

4.5.6 Results on Performance

Performance in the study was measured using three constructs namely profitability, market share and return on assets. Profitability was analyzed using income after tax in the organizations for the years 2011 – 2015. Minimum values, maximum values, means and standard deviations were used to present the findings. The results show a general cyclical trend with the minimum value being -2481 and maximum value of 16967367. In the year 2011, a mean value of 1172659.53 was obtained, which increased to 1427401.89 and 1478541.32 in the year 2012 and 2013 respectively. The mean value however dropped to 1329520.89 in 2014 and increased to 2437625.91 in 2015 as shown in Table 4.9.

Market share was analyzed using the sales for the year 2011 – 2015. There was a cyclical trend in market share as mean values oscillated across the years. The highest mean value was recorded in 2015 (4498060.20) while the lowest value was obtained in 2011 (2021026.55). However, there was increment in sales in 2012(3318930.85) followed by a drop in 2013 and 2014 (2474236.94 and 2313870.27 respectively) then an increase in 2015. The findings on market share are as shown in Table 4.9.

Return on assets (ROA) is an indicator of how profitable a company is relative to its total assets. Return on Assets was therefore obtained by comparing the average total assets employed by the organization and the net income realized in the respective years. Generally, the findings indicate a general increment on ROA over the five year period across all the large manufacturing firms in Kenya. The findings are as shown in Table 4.9.

The study used profitability, market share and ROA to measure organizational performance of manufacturing firms in line with Carroll, Johansen and Mouritsen (2011) who operationalized performance in terms of market share, return on investment, growth of sales, profit margin on sales, growth of market share and growth of return on investment. Other scholars who have also used these measure include Odalo, Njuguna and Achoki (2016) and Ahi and Searcy (2015).

Table 4.9: Performance of Large Manufacturing Firms

Performance	N	Minimum	Maximum	Mean	Std. Deviation
Profitability 2011	245	-2481	9023660	1172659.53	1875074.673
Profitability 2012	244	-22465	11186113	1427401.89	2480298.637
Profitability 2013	245	1104	11517327	1478541.32	2179802.735
Profitability 2014	245	3371	12567395	1329520.89	1920153.248
Profitability 2015	245	2743	16967367	2437625.91	3265348.228
Market Share 2011	264	71706	37236591	2021026.55	2867904.951
Market Share 2012	264	38663	76284575	3318930.85	7951121.348
Market Share 2013	264	125636	87621402	2474236.94	5605723.362
Market Share 2014	264	31892	93120277	2313870.27	5808506.908
Market Share 2015	264	148600	140240088	4498060.20	9309669.316
ROA2011	263	.000000	1.600000	.31921954	.227448829
ROA2012	264	.000000	1.478400	1.09544184	.107720421
ROA2013	264	.000000	1.990000	1.32460375	.264933213
ROA2014	264	.054100	2.149000	1.40995832	.275261491
ROA2015	264	.102400	2.376900	1.49805880	.299609178

4.6 Correlation Analysis

Correlations was done to determine the degree of the relationship between these variables using the Pearson Product-Moment Correlation and therefore ranking was done to determine which independent variable has a strong influence on organization performance. Correlations was done using a 1-tailed test, setting the significance value at 0.05. Values smaller than the significance value (0.05) were deemed as significant while those values greater than 0.05 were said to be insignificant. The correlation coefficient ranges from -1.0 to +1.0 and the closer the coefficient is to +1 or -1, the more closely the two variables are related. The strength of the correlation is measured based on the Pearson correlation scale where, if the correlation coefficient is positive and close

to one, the variables are said to be strongly and positively correlated and vice versa. Correlation analysis was done based on the objectives of the study. The interpretations on the Person coefficient were as follows; r, 0-0.19 is regarded as very weak, 0.2-0.39 as weak, 0.40-0.59 as moderate, 0.6-0.79 as strong and 0.8-1 as very strong correlation.

Findings of the study indicate that green supply chain and organizational performance of large manufacturing firms in Kenya had a Pearson coefficient of 0.567. The significant value was obtained as (p = .000) which was below 0.05 at 1 tailed test conducted in the study. This implies that there was a moderate positive significant relationship between green supply chain and organizational performance. These findings are in concurrence with Laosirihongthong, Adebanjo and Choon Tan (2013) who found that there was a positive relationship between adopting green supply chain management practices and performance of an organization. Further, Andic, Yurt and Baltacıoglu (2012) agreed that green supply chain enhances performance through increasing economy of production, increasing competitive advantage and increasing profit.

The findings also indicate that customer relationship management and organizational performance had a Pearson coefficient of 0.695. The significant value was obtained as (p = .000) which was below 0.05 at 1 tailed test conducted in the study. This implies that there was a strong positive significant relationship between customer relationship management and organizational performance. The present study findings are in agreement with the findings of Ehsani and Hashim (2015) who studied the relationship between customers perceived value with performance in Automaker Company of Iran. The study findings indicated that there were significant relationships between customer relationship management and performance. Further, the study findings agree with the findings of Cheung and To (2011) conducted a study on customer involvement and their perceptions on performance. The study found that customer involvement was related to perceived performance and that positive relationship between customer involvement and performance.

The study determined that supplier relationship management and organizational performance had a Pearson coefficient of 0.343. The significant value was obtained as (p = .000) which was below 0.05 at 1 tailed test conducted in the study. This implies that there was a moderate positive significant relationship between supplier relationship management and organizational performance. The findings obtained are in agreement with those posited by Nyamasege and Biraori (2015) who conducted a study on the factors affecting the effectiveness of supply chain management practices in Kenyan public sector in the national treasury. The study determined that lack of supplier relationship management strategies lowered the effectiveness of supply chain management functions. Further, Mwikali and Kavale (2012) agree with the findings of this study when they posited that cost criterion is a key factor affecting supplier selection for it dictates among many elements, the profit margins.

The results further indicate that outsourcing and organizational performance had a Pearson coefficient of 0.350. The significant value was obtained as (p = .000) which was below 0.05 at 1 tailed test conducted in the study. This implies that there was a moderate positive significant relationship between outsourcing and organizational performance. These findings align with those of Halim, Ahmad and Ramayah (2016) who determined that there is an increasing trend for firms to outsource some of their operations from other services providers in order to improve their business performance. Further, Magara, Oloko and Nyangau (2014) studied the effect of sourcing on profitability of medium motor vehicle firms in Nairobi and recommended that if government policies were implemented correctly, most firms in the sector could improve their financial performance. However, Okatch, Mukulu and Oyugi (2011) disagree with these findings when they found out that the level of subcontracting that takes place in the motor vehicle manufacturing industry was minimal, hence lowering performance.

Finally, the findings indicate that lean supply chain and organizational performance had a Pearson coefficient of 0.492. The significant value was obtained as (p = .000) which was below 0.05 at 1 tailed test conducted in the study. This implies that there was a moderate positive significant relationship between lean supply chain and organizational

performance. The findings of the study are comparable to those of Arif-Uz-Zaman and Nazmul Ahsan (2014) who similarly studied the relationship between lean supply chain and performance in terms of cost and time. The study found that implementing lean supply chain significantly improved cost and time competitive strategies. In addition, Dwayne Whitten, Green Jr and Zelbst (2012) also agree with these findings when they found that lean supply chain strategies positively affected supply chain performance and that, in turn, supply chain performance positively impacted on organizational performance. The findings on the relationship between contemporary supply chain practices and performance are as shown in Table 4.10.

Table 4.10: Overall Correlation Matrix

		Green Supply Chain	Customer relationship management	Supplier Relationship Management	Outsourcing	Lean Supply Chain	Organizational Performance
Green Supply Chain	Pearson Correlation	1					
	Sig. (1-tailed)						
	N	264					
Customer relationship management	Pearson Correlation	.645**	1				
	Sig. (1-tailed)	.000					
	N	264	264				
Supplier Relationship Management	Pearson Correlation	.422**	.568**	1			
	Sig. (1-tailed)	.000	.000				
	N	264	264	264			
Outsourcing	Pearson Correlation	.519**	.379**	.496**	1		
	Sig. (1-tailed)	.000	.000	.000			
	N	264	264	264	264		
Lean Supply Chain	Pearson Correlation	.447**	.409**	.336**	.530**	1	
	Sig. (1-tailed)	.000	.000	.000	.000		
	N	264	264	264	264	264	
Organizational Performance	Pearson Correlation	.567**	.695**	.343**	.350**	.492**	1
	Sig. (1-tailed)	.000	.000	.000	.000	.000	
	N	264	264	264	264	264	264

**. Correlation is significant at the 0.01 level (1-tailed).

4.7 Hypotheses Testing

Hypothesis testing was done to determine the influence of each independent variable on performance of large manufacturing firms. The study used the following hypotheses to test the relationships between the variables of the study: Green supply chain practices

have a positive significant influence on performance of large manufacturing firms; customer relationship management has a positive significant influence on performance of large manufacturing firms; supplier relationship has a positive significant influence on performance of large manufacturing firms; outsourcing practices have a positive significant influence on performance of large manufacturing firms; lean supply chain practices have a positive significant influence on performance of large manufacturing firms and information technology moderates the relationship between contemporary supply chain practices and performance of large manufacturing firms.

H_a1: Green supply chain practices have a positive significant influence on performance of large manufacturing firms.

According to the findings shown in Table 4.11, green supply chain had coefficients (β = .567, t = 11.143, p = .000). The significant value obtained was less than 0.05 set by the study, similar to the t value which was more than 1.96 at 5% significant level. The results therefore imply that there was a positive significant relationship between green supply chain and organizational performance in the large manufacturing firms of Kenya. Based on the findings, the study rejects the null hypothesis and therefore confirm that green supply chain practices have a positive significant influence on performance of large manufacturing firms.

H_a2: Customer relationship management has a positive significant influence on performance of large manufacturing firms.

According to Table 4.11, customer relationship management had coefficients (β = .695, t = 15.659, p = .000). The significant value obtained was less than 0.05 set by the study, similar to the t value which was more than 1.96 at 5% significant level. The results therefore implied that there was a positive significant relationship between customer relationship management and organizational performance in the large manufacturing firms of Kenya. Based on the findings, the study rejected the null hypothesis and therefore confirmed that customer relationship management had a positive significant influence on performance of large manufacturing firms.

H_a3: Supplier relationship management has a positive significant influence on performance of large manufacturing firms.

In addition, supplier relationship management had coefficients (β = .343, t = 5.915, p = .000). The significant value obtained was less than 0.05 set by the study, similar to the t value which was more than 1.96 at 5% significant level. The results therefore imply that there was a positive significant relationship between supplier relationship management and organizational performance in the large manufacturing firms of Kenya. Based on the findings, the study rejected the null hypothesis and therefore confirmed that supplier relationship management had a positive significant influence on performance of large manufacturing firms.

H_a4: Outsourcing has a positive significant influence on performance of large manufacturing firms.

Similarly, outsourcing had coefficients (β = .350, t = 6.047, p = .000). The significant value obtained was less than 0.05 set by the study, similar to the t value which was more than 1.96 at 5% significant level. The results therefore imply that there was a positive significant relationship between outsourcing and organizational performance in the large manufacturing firms of Kenya. Based on the findings, the study rejected the null hypothesis and confirmed that outsourcing had a positive significant influence on performance of large manufacturing firms.

H_a5: Lean supply chain has a positive significant influence on performance of large manufacturing firms.

The study found that lean supply chain had coefficients (β = .492, t = 9.148, p = .000). The significant value obtained was <0.05, similar to the t value which was >1.96 at 5% significant level. This implied that there was a positive significant relationship between lean supply chain and organizational performance of the large manufacturing firms in Kenya. The study therefore rejected the null hypothesis and affirmed that lean supply chain had a positive significant influence on performance.

H_a6: Information technology moderates the relationship between contemporary supply chain practices and performance of large manufacturing firms.

Table 4.11 indicated an R^2 change of 0.029 implying that when information technology was included as a moderating variable, the R^2 value increased by 0.029. This indicated that information technology as a moderating variable improved the relationship between contemporary supply chain practices and performance by 2.9%. This means that information technology was a good moderating variable and therefore the study rejected the null hypothesis and concluded that information technology moderates the relationship between contemporary supply chain practices and performance of large manufacturing firms.

Table 4.11: Hypotheses Testing

Hypothesis	Beta	T value	P-value	Conclusion
H_a1: Green supply chain practices have a positive significant influence on performance of large manufacturing firms.	.469	11.143	0.000	Reject H_01
H_a2: Customer relationship management has a positive significant influence on performance of large manufacturing firms.	.890	15.659	0.000	Reject H_02
H_a3: Supplier relationship has a positive significant influence on performance of large manufacturing firms.	.334	5.915	0.000	Reject H_03
H_a4: Outsourcing practices have a positive significant influence on performance of large manufacturing firms.	.483	6.047	0.000	Reject H_04
H_a5: Lean supply chain practices have a positive significant influence on performance of large manufacturing firms.	.554	9.148	0.000	Reject H_05
H_a6: Information technology moderates the relationship between contemporary supply chain practices and performance of large manufacturing firms.	.317	$R2\ \Delta$ 0.029	0.000	Reject H_06

4.8 Diagnostic Tests

The study conducted diagnostic tests which included, linearity, normality tests and homoscedasticity test. The tests were done to determine if the data collected were accurate, reliable, valid and capable of inferring the study results to the population. Further, the diagnostic tests were done to determine if regression analysis was valid or not. The section is arranged beginning with linearity test, followed by normality test and finally the homoscedasticity test. In the event that the diagnostic tests failed the meet the criteria set, the study revised the variables.

4.8.1 Linearity Test

Durbin - Watson statistic test was applied to determine whether there is a significant relationship between the dependent and each of the independent variables and whether the relationship is linear or not. The study adopted a significant deviation from linearity of greater than 0.05 to imply that the relationship between the independent variable is linearly dependent and vice versa. The findings indicate that there was a linear relationship between the contemporary supply chain practices and performance. Green supply chain had a significant deviation from linearity of 0.098, customer relationship management had a significant deviation from linearity of 0.182, supplier relationship management had a significant deviation from linearity of 0.067, outsourcing had a significant deviation from linearity of 0.191 and lean supply chain had a significant deviation from linearity of 0.084. The findings are shown in Table 4.12.

Table 4.12: Linearity Test

			Sum of Squares	df	Mean Square	F	Sig.
Organizational Performance * Green Supply Chain	Between Groups	(Combined)	63.793	4	15.948	42.350	.000
		Linearity	50.990	1	50.990	135.401	.000
		Deviation from Linearity	12.803	3	4.268	11.333	.098
	Within Groups		97.536	259	.377		
	Total		161.330	263			
Organizational Performance * Customer Relationship	Between Groups	(Combined)	96.982	3	32.327	130.622	.000
		Linearity	96.134	1	96.134	388.439	.000
		Deviation from Linearity	.848	2	.424	1.713	.182
	Within Groups		64.347	260	.247		
	Total		161.330	263			
Organizational Performance * Supplier Relationship Management	Between Groups	(Combined)	40.368	3	13.456	28.923	.000
		Linearity	32.600	1	32.600	70.071	.000
		Deviation from Linearity	7.768	2	3.884	8.349	.067
	Within Groups		120.961	260	.465		
	Total		161.330	263			
Organizational Performance * Outsourcing	Between Groups	(Combined)	36.113	4	9.028	18.674	.000
		Linearity	33.797	1	33.797	69.907	.000
		Deviation from Linearity	2.316	3	.772	1.597	.191
	Within Groups		125.217	259	.483		
	Total		161.330	263			
Organizational Performance * Lean Supply Chain	Between Groups	(Combined)	57.433	4	14.358	35.793	.000
		Linearity	33.684	1	33.684	83.968	.000
		Deviation from Linearity	23.749	3	7.916	19.734	.084
	Within Groups		103.897	259	.401		
	Total		161.330	263			

4.8.2 Normality Test

Normality test was done using Shapiro–Wilk test and Kolmogorov Tests. The study conducted normality test at 95% confidence interval for mean where the p-value was compared to determine whether to reject the null hypothesis meaning that data was either normally distributed (greater than 0.05) or not (less than 0.05). The findings indicate contemporary supply chain practices were normally distributed in the study. Green supply had Shapiro-Wilk p value of 0.051 and Kolmogrov-Smirnov p value of 0.063, customer relationship management had Shapiro-Wilk p value of 0.050 and Kolmogrov-Smirnov p value of 0.059, supplier relationship management had Shapiro-Wilk p value of 0.054 and Kolmogrov-Smirnov p value of 0.066, outsourcing had Shapiro-Wilk p value of 0.055 and Kolmogrov-Smirnov p value of 0.076 and lean supply chain had Shapiro-Wilk p value of 0.051 and Kolmogrov-Smirnov p value of 0.054 as shown in Table 4.13.

Table 4.13: Normality Test

	Green Supply Chain	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Organizational Performance	2.000	.310	21	.063	.784	21	.051
	3.000	.399	88	.000	.643	88	.000
	4.000	.296	99	.000	.813	99	.000
	5.000	.490	55	.000	.490	55	.000
	Customer Relationship	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Organizational Performance	2.000	.407	6	.059	.640	6	.050
	3.000	.381	41	.000	.744	41	.000
	4.000	.453	142	.000	.456	142	.000
	5.000	.511	75	.000	.243	75	.000
	Supplier Relationship Management	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Organizational Performance	2.00	.307	4	.066	.729	4	.054
	3.00	.350	62	.000	.764	62	.000
	4.00	.313	123	.000	.732	123	.000
	5.00	.334	75	.000	.744	75	.000
	Outsourcing	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Organizational Performance	1.00	.290	8	.076	.794	8	.055
	2.00	.363	21	.000	.781	21	.000
	3.00	.276	44	.000	.842	44	.000
	4.00	.438	125	.000	.622	125	.000
	5.00	.386	66	.000	.666	66	.000
	Lean Supply Chain	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Organizational Performance	1.00	.426	15	.054	.562	15	.051
	2.00	.308	45	.000	.760	45	.000
	3.00	.397	69	.000	.727	69	.000
	4.00	.424	86	.000	.597	86	.000
	5.00	.305	49	.000	.738	49	.000

a. Lilliefors Significance Correction

4.8.3 Homoscedasticity Test

Homoscedasticity test was carried out to determine the circumstance in which the variability of a variable is equal across the range of values of a second variable that predicts it. This was achieved through use of homogeneity tests. When the level of significance associated with Levene statistic is more than 0.05 at 5% significance level, then the variances are homogenous. From the study findings of test for homogeneity, the probability associated with the Levene Statistic for green supply chain is 0.055 which is more than the level of significance (0.05) testing at 1%-tail test 5% significance level, the researcher concludes that the variance is homogeneous for green supply chain variable. The same was obtained for customer relationship management, supplier relationship management, outsourcing and lean supply chain with significant values associated with Levene statistic being 0.062, 0.059, 0.062 and 0.051 respectively. The findings are shown in Table 4.14.

Table 4.14: Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
Green Supply Chain	3.817	4	259	.055
Customer Relationship	9.326	4	259	.062
Supplier Relationship Management	5.245	4	259	.059
Outsourcing	3.280	4	259	.062
Lean Supply Chain	16.609	4	259	.051

4.9 Regression Analysis

The regression was conducted using a simple regression analysis which involved running the least square regression method and interpreting the R^2 values, F values and coefficients. The strength and reliability of the regression model was determined using the coefficient of determination (R^2) and F-test. The R^2 value of 0% indicates that the model explains none of the variability of the response data around its mean. 100%

indicates that the model explains all the variability of the response data around its mean. Similarly, the study compared the F-value with the overall significance level to determine if the hypotheses are significant or not.

4.9.1 Influence of Green Supply Chain Practices on Performance

The study purposed to determine the relationship between green supply chain practices and performance of large manufacturing firms in Kenya. To fulfil this aim, the study conducted regression analysis and interpreted the coefficient of determination to find the relationship between green supply chain and performance in large manufacturing firms in Kenya. Further, the study compared the F value with p value to determine the appropriateness of the model. The model gives the findings on the influence of green supply chain on performance. The R^2 value for the relationship between supply chain and performance was 0.322 which implied that 32.2% of the variation in performance could be attributed to changes in green supply chain in the large manufacturing firms of Kenya.

The study further conducted ANOVA to test for the reliability of the regression model. The significant value was 0.000 which is less than 0.05 at 95% confidence level. The F value was 124.177 implying that the model was reliable in predicting the relationship between green supply chain and performance. The results are shown in Table 4.15. Based on the ordinary least square model; $Y= \beta_0 + \beta_1 X_1 + \varepsilon$ for the ordinary least square model, the ordinary least model therefore will be; $Y = 2.509 + 0.469X_1 + 0.161$ which implies that a unit increase in green supply chain will lead to 46.9% increase in performance. This implies that green supply chain is an important practice that should be adopted by organizational in order to achieve improved performance.

The findings obtained in the study agree with the findings of Mitra and Datta (2014) who studied the adoption of green supply chain management practices and their impact on performance in the Indian manufacturing firms. Results of data analysis showed that supplier collaboration for environmental sustainability had a positive impact on

environmentally sustainable product design and logistics, which in turn was positively related to competitiveness and economic performance of the firm. The findings of the study also agree with those of Green Jr, Zelbst, Meacham and Bhadauria (2012) who determined that the adoption of GSCM practices by manufacturing organizations led to improved environmental performance and economic performance, which, in turn, positively impacted operational performance. Further, the findings are in line with those of Yu, Chavez, Feng and Wiengarten (2014) who determined that there was a significant and positive relationship between GSCM and operational performance in terms of flexibility, delivery, quality and cost.

Table 4.15: Regression Results for Green Supply Chain

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.567[a]	.322	.319	.76507	.322	124.177	1	262	.000

a. Predictors: (Constant), Green Supply Chain

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72.685	1	72.685	124.177	.000[b]
	Residual	153.358	262	.585		
	Total	226.044	263			

a. Dependent Variable: Organizational Performance
b. Predictors: (Constant), Green Supply Chain

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.509	.161		15.602	.000
	Green Supply Chain	.469	.042	.567	11.143	.000

a. Dependent Variable: Organizational Performance

4.9.2 Influence of Customer relationship management on Performance

The study sought to determine the relationship between customer relationship management and performance of large manufacturing firms in Kenya. The study conducted regression analysis using a simple regression approach where regression analysis was run and results tabulated. The purpose of regression analysis was to determine the influence of customer relationship management on performance and whether the model was statistically significant. The results are presented in Table 4.16.

The model shows the influence of customer relationship management on performance. The R^2 value for the relationship between customer relationship management and performance was 0.483 implied that 48.3% of the variation in performance could be attributed to changes in customer relationship management in the large manufacturing firms of Kenya while 51.7% of the variation can be attributed to other factors other than customer relationship management. The findings imply that customer service was an important antecedent of performance in large manufacturing firms. Based on the ordinary least square model; $Y= \beta_0 + \beta_2 X_2 + \varepsilon$, the ordinary least model therefore will be; $Y = 0.701 + 0.890X_2 + 0.229$ which implies that a unit increase in customer relationship management will lead to 77.7% increase in performance. The findings there postulate that customer relationship management is a critical determinant of performance in the large manufacturing firms in Kenya.

Using the ANOVA results, the significant value for the model was 0.000 which is less than 0.05 at 95% confidence level. The model was also significant as shown by F value, $F = 245.193$. This implied that the model was reliable in predicting the relationship between customer relationship management and performance. The findings obtained in the study agree with those of Abdul, Basri and Shaharuddin (2013) who suggested that the dimensions of customer relationship management which included customer orientation, customer relationship management organization, knowledge management and technology based customer relationship management had a positive and significant impact on different perspectives of performance. The findings also align with those of

Akroush, Dahiyat, Gharaibeh and Abu-Lail (2011) who determined that there was a positive and significant relationship between customer relationship management and business performance which comprised of financial and marketing performance indicators.

Table 4.16: Regression Results for Customer relationship management

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.695[a]	.483	.481	.66759	.483	245.193	1	262	.000

a. Predictors: (Constant), Customer relationship management

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	109.277	1	109.277	245.193	.000[b]
	Residual	116.767	262	.446		
	Total	226.044	263			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Customer relationship management

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.701	.229		3.064	.002
	Customer Relationship	.890	.057	.695	15.659	.000

a. Dependent Variable: Organizational Performance

4.9.3 Influence of Supplier Relationship Management on Performance

The study sought to determine the influence of supplier relationship management on performance of large manufacturing firms in Kenya. To fulfil this objective, the study carried out regression analysis to determine the influence of supplier relationship

management on performance of large manufacturing firms in Kenya. The study used coefficients to determine the significance of the relationship between the variables. The findings on the influence of supplier relationship management on performance show that an R^2 value of 0.118 was obtained for the relationship between supplier relationship management and performance. This implied that 11.8% of the variation in performance could be attributed to changes in supplier relationship management in the large manufacturing firms of Kenya. The findings are presented in Table 4.17.

The study also conducted ANOVA test in order to test the significance of the model. The significant value for the model was 0.000 which is less than 0.05 at 95% confidence level. The model was also significant as shown by F value, F = 34.989. This implies that the model was reliable in predicting the relationship between supplier relationship management and performance. Based on the ordinary least square model; $Y= \beta_0 + \beta_3X_3 + \varepsilon$, the ordinary least model therefore will be; $Y = 3.002 + 0.334X_3 + 0.213$. This implies that a unit increase in supplier relationship management will lead to 33.4% increase in performance. The findings imply that developing suppliers and having good supplier relationship techniques will assist large manufacturing firms to improve on their performance.

The findings are supported by Yang and Zhang (2017) who found that sustainable supplier development and sustainable supplier collaboration have positive relationships with performance, while sustainable supplier selection, sustainable supplier monitoring and sustainable supplier collaboration have positive influence on buyer-supplier relationship and buyer competitive advantage. Further, the findings agree with Asare, Brashear, Yang, and Kang (2013) who found that found that a firm's supplier development activities can lead to improvements in its marketing processes, hence improved overall performance.

Table 4.17: Regression Results for Supplier Relationship Management

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.343[a]	.118	.114	.87242	.118	34.989	1	262	.000

a. Predictors: (Constant), Supplier Relationship Management

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.631	1	26.631	34.989	.000[b]
	Residual	199.413	262	.761		
	Total	226.044	263			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Supplier Relationship Management

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3.002	.213		14.072	.000
	Supplier Relationship Management	.334	.056	.343	5.915	.000

a. Dependent Variable: Organizational Performance

4.9.4 Influence of Outsourcing on Performance

The study aimed at assessing the influence of outsourcing on the performance of large manufacturing firms in Kenya. The study undertook regression analysis which involved running regression analysis on outsourcing and performance and analyzing the coefficient of determination, the F value and the regression coefficients in order to assess the relationship between the two variables. Table 4.18 indicate that an R^2 value for the relationship between outsourcing and performance was 0.122. This implies that 12.2% of the variation in performance can be attributed to changes in outsourcing in the

large manufacturing firms of Kenya. The findings imply that outsourcing has a small influence on performance in the large manufacturing firms.

The study also conducted ANOVA test to determine the significance of the statistical models. The significant value for the model was 0.000 which was less than 0.05 at 95% confidence level. The model was also significant as shown by F value, $F = 36.572$. This implies that the model was reliable in predicting the relationship between outsourcing and performance. Based on the ordinary least square model; $Y= \beta_0 + \beta_4X_4 + \varepsilon$, the ordinary least model therefore will be; $Y = 2.297 + 0.487X_4 + 0.323$. This implies that a unit increase in outsourcing will lead to 48.7% increase in performance.

The findings imply that outsourcing was a critical practice that leads to improved performance in terms of increased sales, return on assets and profitability. The findings of the present study are in disagreement with those of Meixell, Kenyon and Westfall (2014) who postulated that outsourcing had no relationship with organizational performance. However, the study findings agree with those of Nyameboame and Haddud (2017) who determined that outsourcing was significant in enhancing the performance. The study therefore affirms the importance of outsourcing in improving the performance of the manufacturing firms.

Table 4.18: Regression Results for Outsourcing

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.350[a]	.122	.119	.87010	.122	36.572	1	262	.000

a. Predictors: (Constant), Outsourcing

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	27.688	1	27.688	36.572	.000[b]
	Residual	198.356	262	.757		
	Total	226.044	263			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Outsourcing

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.297	.323		7.115	.000
	Outsourcing	.483	.080	.350	6.047	.000

a. Dependent Variable: Organizational Performance

4.9.5 Influence of Lean Supply Chain on Performance

The study purposed to determine the influence of lean supply chain on performance of large manufacturing firms in Kenya. To achieve the objective, the study conducted a regression analysis which involved running the regression model composed of regression analysis between lean supply chain and performance. This was done to determine the relationship between lean supply chain and performance in large manufacturing firms. Table 4.19 showed that an R^2 value for the relationship between outsourcing and performance was 0.242. This implied that 24.2% of the variation in performance could be attributed to changes in lean supply chain in the large manufacturing firms of Kenya.

From ANOVA test findings, the significant value for the model was 0.000 which is less than 0.05 at 95% confidence level. The model was also significant as shown by F value, F = 83.681. This implied that the model was reliable in predicting the relationship between lean supply chain and performance. Therefore, based on the ordinary least square model; $Y= \beta_0 + \beta_5 X_5 + \varepsilon$, the ordinary least model therefore will be; $Y = 2.200 + 0.554X_5 + 0.227$. This implied that a unit increase in lean supply chain would lead to 55.4% increase in performance of large manufacturing firms in Kenya. The study findings imply that large manufacturing firms should therefore focus on implementing lean practices in terms of agility, lean production and logistics management.

The findings of the study are in line with those of Prajogo, Oke and Olhager (2016) who determined that there was a significant direct relationship between lean production processes have a positive effect on inbound supply performance. Further, the findings also agree with those of Agus and Shukri (2012) who found a strong association between lean production, product quality performance, and business performance.

Table 4.19: Regression Results for Lean Supply Chain

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics			
					R Square Change	F Change	df1	df2	Sig. F Change
1	.492[a]	.242	.239	.80865	.242	83.681	1	262	.000

a. Predictors: (Constant), Lean Supply Chain

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	54.720	1	54.720	83.681	.000[b]
	Residual	171.324	262	.654		
	Total	226.044	263			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Lean Supply Chain

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.200	.227		9.710	.000
	Lean Supply Chain	.554	.061	.492	9.148	.000

a. Dependent Variable: Organizational Performance

4.9.6 Moderating influence of information technology on the relationship between contemporary supply chain practices and performance

The moderating influence of information technology on the relationship between contemporary supply chain practices and performance was sought in the study. The study used a multi-stage approach to determine the influence of the moderator. The study used a moderated multiple regression models to assess the moderating influence of information technology. The moderated multiple regression models involved first running regression analysis between contemporary supply chain practices and

performance; contemporary supply chain with the moderator included as a variable and finally running regression with the moderator to observe the interaction effect between technology and contemporary supply chain practices.

Table 4.20 provided a model summary indicating an R^2 value of 0.555 for the relationship between contemporary supply chain practices (lean supply chain, supplier relationship management, green supply chain, outsourcing, and customer relationship) and performance implying that 55.5% of the variation in performance could be attributed to contemporary supply chain practices. When information technology was included as a variable, the R^2 value increased to 0.572 implying that 57.2% of the variation in performance could be attributed to technology and contemporary supply chain practices. Further, when technology moderated the relationship between contemporary supply chain practices and performance, the study realized an R^2 value of 0.584 which indicated 58.4% of the variation in performance could be attributed to contemporary supply chain practices when moderated by information technology.

The study carried out ANOVA test to determine the significance of the models. The significant values for the first, second and the moderated model were all 0.000 which was <0.05 at 95% confidence level indicating that the models were statistically significant as shown by F values, F_1 = 64.419, F_2 = 57.318, F_3 = 35.445. This implies that the models were reliable and could be used for statistical inference. In addition, the study analyzed the coefficients and compared the beta and p values in order to determine the effect of the moderator on the contemporary supply chain practices.

The study findings indicate that green supply chain had coefficients (β = .146, t = 2.450, p = .015); customer relationship management had coefficients (β = .577, t = 9.436, p = .000); supplier relationship management had coefficients (β = -.120, t = -2.209, p = .028); outsourcing had coefficients (β = -.010, t = -.184, p = .854); and Lean supply chain had coefficients (β = .327, t = 4.637, p = .000). The significant values obtained for all variables was <0.05, similar to the t value which was >1.96 at 5% significant level except for outsourcing. This implies that there was a positive significant relationship

between green supply chain, customer relationship management and lean supply chain and organizational performance. However, there was a negative significant relationship between supplier relationship management and performance. On the hand, outsourcing was not significant.

The study analyzed the coefficients derived when information technology was introduced as a variable and findings indicate that supply chain had coefficients (β = .121, t = 2.057, p = .041); customer relationship management had coefficients (β = .570, t = 9.493, p = .000); supplier relationship management had coefficients (β = -.117, t = -2.197, p = .029); outsourcing had coefficients (β = -.019, t = -.342, p = .733); Lean supply chain had coefficients (β = .156, t = 2.765, p = .006) and Information technology (β = .166, t = 3.203, p = .002). The implication of the findings is that information technology influences contemporary supply chain practices and performance.

The study found that green supply chain had coefficients (β = .178, t = 2.929, p = .004); customer relationship management had coefficients (β = .477, t = 7.554, p = .000); supplier relationship management had coefficients (β = -.056, t = -.988, p = .324); outsourcing had coefficients (β = .004, t = .066, p = .947); lean supply chain had coefficients (β = .147, t = 2.600, p = .010). When the interaction effect of information technology was factored in, green supply chain had coefficients (β = -.183, t = -2.081, p = .038); customer relationship management had coefficients (β = -.005, t = -.041, p = .968); supplier relationship management had coefficients (β = .087, t = 1.374, p = .171); outsourcing had coefficients (β = -.053, t = -.891, p = .374); and lean supply chain had coefficients (β = -.013, t = -.146, p = .884). This implies that information technology when interacting with individual contemporary supply chain practices renders all contemporary all insignificant except green supply chain. However, when acting collectively, the model was significant therefore implying that information moderated all contemporary supply chain practices jointly but nor severely. The study therefore rejected the null hypothesis and confirmed that information technology moderated the relationship between contemporary supply chain practices and performance of large manufacturing firms.

The findings of the study concur with those of Magutu (2013) who determined that the coefficient of the product variable show a very strong moderating effect of information technologies on the relationship between supply chain strategies and supply chain performance compared to the relationship between supply chain strategies and firm performance without information technology as a moderator. The findings are also in line with those of Esmaeel, Sukati and Jamal (2015) who advocated that information technology had a significant effect on the relationship between supply chain and performance. The study is also in line with Gupta, Kalia and Shirvastava (2010) who postulated that information technology provided the required foundation to support the business processes and provided tools to measure, contain, mitigate and solve environmental problems which is critical to a sustainable future. The key information technology focus areas in green supply chain that enable a transition to a green organization were product life cycle management, supply chain network and logistics optimization, process optimization and green reporting.

The findings obtained in the study align with those of Feng, Cai, Zhang and Liu (2016) who investigated the influence of information technology on the relationship between customer involvement and performance. The study found that customer involvement was influenced by the level of information technology implemented by the organizations studied. The present study is also a comparative study to Wanyoike, Mukulu and Waititu (2012) who assessed the role of information technology as a moderator to the influence of customer relationship management on performance of SMEs in urban areas in Kenya. The findings indicated that SMEs adopted information technology which improved customer service and consequently performance.

The findings of the study are also similar to the findings of Marinagi, Trivellas and Reklitis (2015) who confirmed the mediating role of information technology. The main implication of the findings for managers was that information technology among partners along the supply chain facilitated higher overall performance, as a result of enforced supply chain management practices elevating information reliability and quality. Further, Fawcett, Wallin, Allred, Fawcett, and Magnan (2011) found that

investments in IT made the greatest competitive contribution when they enable a dynamic supply chain collaboration capability, which enhanced performance.

The findings further agree with Maiga, Nilsson and Jacobs (2014) who determined that manufacturing plants will reap the greatest financial performance benefits from investments in activity-based cost control systems when combined with information technology integration. The findings were validated by Qrunfleh and Tarafdar (2014) who argued that information systems enhanced the relationship between lean supply chain strategy and performance. The study also found a positive association between supply chain performance and firm performance, and a partial mediation effect of supply chain performance on the relation between lean supply chain and firm performance. Further, Zhou et al. (2014) recommended that firms needed to align supply chain practice with the level of their information quality in order to achieve good overall business performance.

Table 4.20: Moderated Multiple Regression Model

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.745[a]	.555	.547	.62423	.555	64.419	5	258	.000
2	.757[b]	.572	.562	.61333	.572	57.318	6	257	.000
3	.764[c]	.584	.567	.61002	.584	35.445	10	253	.000

a. Predictors: (Constant), Lean Supply Chain, Supplier Relationship Management, Green Supply Chain, Outsourcing, Customer relationship management

b. Predictors: (Constant), Information Technology, Supplier Relationship Management, Green Supply Chain, Outsourcing, Lean Supply Chain, Customer relationship management

c. Predictors: (Constant), Lean*Technology, Supplier Relationship Management, Green Supply Chain, Supplier*Technology, Lean Supply Chain, Outsourcing, Outsourcing*Technology, Customer relationship management, Green*Technology, Customer*Technology

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	125.509	5	25.102	64.419	.000[b]
	Residual	100.534	258	.390		
	Total	226.044	263			
2	Regression	129.368	6	21.561	57.318	.000[c]
	Residual	96.676	257	.376		
	Total	226.044	263			
3	Regression	131.898	10	13.190	35.445	.000[d]
	Residual	94.146	253	.372		
	Total	226.044	263			

a. Dependent Variable: Organizational Performance

b. Predictors: (Constant), Lean Supply Chain, Supplier Relationship Management, Green Supply Chain, Outsourcing, Customer relationship management

c. Predictors: (Constant), Information Technology, Supplier Relationship Management, Green Supply Chain, Outsourcing, Lean Supply Chain, Customer relationship management

d. Predictors: (Constant), Lean*Technology, Supplier Relationship Management, Green Supply Chain, Supplier*Technology, Lean Supply Chain, Outsourcing, Outsourcing*Technology, Customer relationship management, Green*Technology, Customer*Technology

Coefficients[a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.372	.283		4.312	.001
	Green Supply Chain	.120	.049	.146	2.450	.015
	Customer Relationship	.739	.078	.577	9.436	.000
	Supplier Relationship Management	-.117	.053	-.120	-2.209	.028
	Outsourcing	-.014	.078	-.010	-2.884	.024
	Lean Supply Chain	.267	.058	.237	4.637	.000
2	(Constant)	-.394	.367		-2.974	.004
	Green Supply Chain	.100	.049	.121	2.057	.041
	Customer Relationship	.730	.077	.570	9.493	.000
	Supplier Relationship Management	-.114	.052	-.117	-2.197	.029
	Outsourcing	-.026	.076	-.019	-2.142	.033
	Lean Supply Chain	.175	.063	.156	2.765	.006
	Information Technology	.317	.099	.166	3.203	.002
3	(Constant)	.857	.319		2.686	.008
	Green Supply Chain	.147	.050	.178	2.929	.004
	Customer Relationship	.624	.083	.487	7.554	.000
	Supplier Relationship Management	-.055	.055	-.056	-2.988	004
	Outsourcing	.005	.077	.004	2.066	.047
	Lean Supply Chain	.165	.064	.147	2.600	.010
	Green*Technology	-.269	.129	-.183	-2.081	.038
	Customer*Technology	-.007	.183	-.005	-2.741	.008
	Supplier*Technology	.222	.162	.087	4.374	.001
	Outsourcing*Technology	-.182	.204	-.053	-3.091	.004
	Lean*Technology	-.019	.131	-.013	-2.146	.014

a. Dependent Variable: Organizational Performance

4.10 Optimal Model

Statistical modelling is a simplified, mathematically-formalized way to approximate reality and optionally to make predictions from the study approximation. In the context of this study, statistical model will help predict future relationship between contemporary chain, information technology and performance in large manufacturing firms in Kenya. The study adopted hierarchical regression to test three models. Model one only constituted the contemporary supply chain without considering the moderating variable. Model two was fitted including the moderating variable of information technology while model three included the interaction variables between the contemporary supply chain practices and the moderator. The result of the first model generated an equation given as:

$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \varepsilon$

Where; Y is Organizational Performance

β_0 is the constant

$\beta_1 - \beta_5$ are the coefficients of the independent variables

$X_1 - X_5$ are Green Supply Chain, Customer relationship management, Supplier Relationship, Outsourcing and Lean Supply Chain respectively. ε is the error term.

Based on the outcome of the regression analysis shown in Table 4.20, the model therefore was;

$Y = 0.372 + 0.120X_1 + 0.739X_2 - 0.117X_3 - 0.014X_4 + 0.267X_5 + 0.283$……i

Model two results show that addition of the moderating variable to the initial model improved the model. The study also found that in the joint model with the contemporary supply chain practices, the moderating variable of information technology had significant influence on performance. The second was adopted as follows;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 Z + \varepsilon$$

Where; Y is Organizational Performance

β_0 is the constant

$\beta_1 - \beta_5$ are the coefficients of the independent variables

$X_1 - X_5$ are Green Supply Chain, Customer relationship management, Supplier Relationship, Outsourcing and Lean Supply Chain respectively.

Z is the moderator (Information Technology) and ε is the error term.

Based on the outcome of the regression analysis shown in Table 4.20, the model therefore became;

$$Y = -0.394 + 0.100X_1 + 0.730X_2 - 0.114X_3 - 0.026X_4 + 0.175X_5 + 0.317Z + 0.367 \ldots\ldots\ldots\ldots\ldots ii$$

This model implies that when all contemporary practices and information technology are held constant except green supply chain, performance will improve by 0.1. Further, when all contemporary practices and information technology are held constant except customer supplier relationship, performance will improve by 0.73; however, when all contemporary practices and information technology are held constant except supplier relationship management, performance will reduce by 0.114. Similarly, when all contemporary practices and information technology are held constant except outsourcing, performance will reduce by 0.026. When all contemporary practices and information technology are held constant except lean supply chain, performance will improve by 0.175. Finally, when all contemporary practices are held constant, information technology will improve performance by 0.317.

The results for the third model show that addition of the interaction variables on individual contemporary practices significantly improved the model. The change statistics showed a p-value of 0.000 which was less than 0.05. The individual interaction

variables were however not significant except green supply chain which reduced performance. The final model generated an equation given by;

$Y= \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_1X_1*Z + \beta_2X_2*Z + \beta_3X_3*Z + \beta_4X_4*Z + \beta_5X_5*Z + \varepsilon$

Where; Y is Organizational Performance

β_0 is the constant

$\beta_1 - \beta_5$ are the coefficients of the independent variables

$X_1 - X_5$ are Green Supply Chain, Customer relationship management, Supplier Relationship, Outsourcing and Lean Supply Chain respectively.

Z is the moderator (Information Technology) and ε is the error term.

Based on the outcome of the regression analysis shown in Table 4.20, the model therefore became;

$Y = 0.857 + 0.147X_1 + 0.624X_2 - 0.055X_3 + 0.005X_4 + 0.165X_5 - 0.269X_1*Z - 0.007X_2*Z + 0.222X_3*Z - 0.182X_4*Z - 0.019X_5*Z + 0.319$……..iii

This model implies when all contemporary practices are held constant other than green supply chain, a unit increase in green supply chain will improve performance by 0.147. Likewise, when all contemporary practices are held constant other than customer relationship management, a unit increase in customer relationship management will improve performance by 0.624. However, when all contemporary practices are held constant other than supplier relationship management, a unit increase in supplier relationship management will reduce performance by 0.055. When all contemporary practices are held constant other than outsourcing, a unit increase in outsourcing will increase performance by 0.005 and when all contemporary practices are held constant other than lean supply chain, a unit increase in lean supply chain will improve performance by 0.165.

The interaction effect of contemporary supply chain practices and information technology show that when all variables are held constant other than the interaction between green supply chain and technology, performance reduces by 0.269; when all variables are held constant other than the interaction between customer relationship management and technology, performance reduces by 0.007; when all variables are held constant other than the interaction between supplier relationship management and technology, performance improves by 0.222; when all variables are held constant other than the interaction between outsourcing and technology, performance reduces by 0.182; and when all variables are held constant other than the interaction between lean supply chain and technology, performance reduces by 0.019. Upon comparing the coefficients of the third model and their respective p values, the study found that only green supply chain was statistically significant. This meant that information technology only moderated contemporary supply chain practices when acting jointly but not individually. It was also important to re-align the model given the study findings. The model was therefore adjusted to the optimal model iv;

$$\mathbf{Y = 0.857 + 0.624X_1 + 0.222X_2*Z + 0.165X_3 + 0.147X_4 + 0.005X_5 - 0.007X_1*Z - 0.019X_3*Z - 0.055X_2 - 0.182X_5*Z - 0.269X_4*Z + 0.319}\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\mathbf{..iv}$$

Where; Y is Organizational Performance

β_0 is the constant

$\beta_1 - \beta_5$ are the coefficients of the independent variables

$X_1 - X_5$ are Customer relationship management, Supplier Relationship, Lean Supply Chain, Green Supply Chain, Outsourcing respectively.

Z is the moderator (Information Technology) and ε is the error term.

4.11 Revised Conceptual Framework

The study revised the conceptual postulated in Figure 2.1 to incorporate the new knowledge gained as reflect the ranking based on the strongest variables to the lowest ones. From the findings, customer relationship management was found to have the greatest influence on performance of large manufacturing firms in Kenya while outsourcing practices was found to have the least influence on performance of large manufacturing firms in Kenya. Figure 4.4 shows the ranking of the study variables.

The study found a positive relationship between contemporary supply chain practices and performance of the large manufacturing firms in Kenya. In addition, information technology was found to be an important moderator for the relationship between contemporary supply chain practices and performance. In order to improve performance, the study found that information technology should be applied across all the contemporary supply chain practices as they complement each other in improving performance. In the event that information technology is applied selectively, the study found that there was no significant relationship between contemporary supply chain practices and performance of the large manufacturing firms in Kenya.

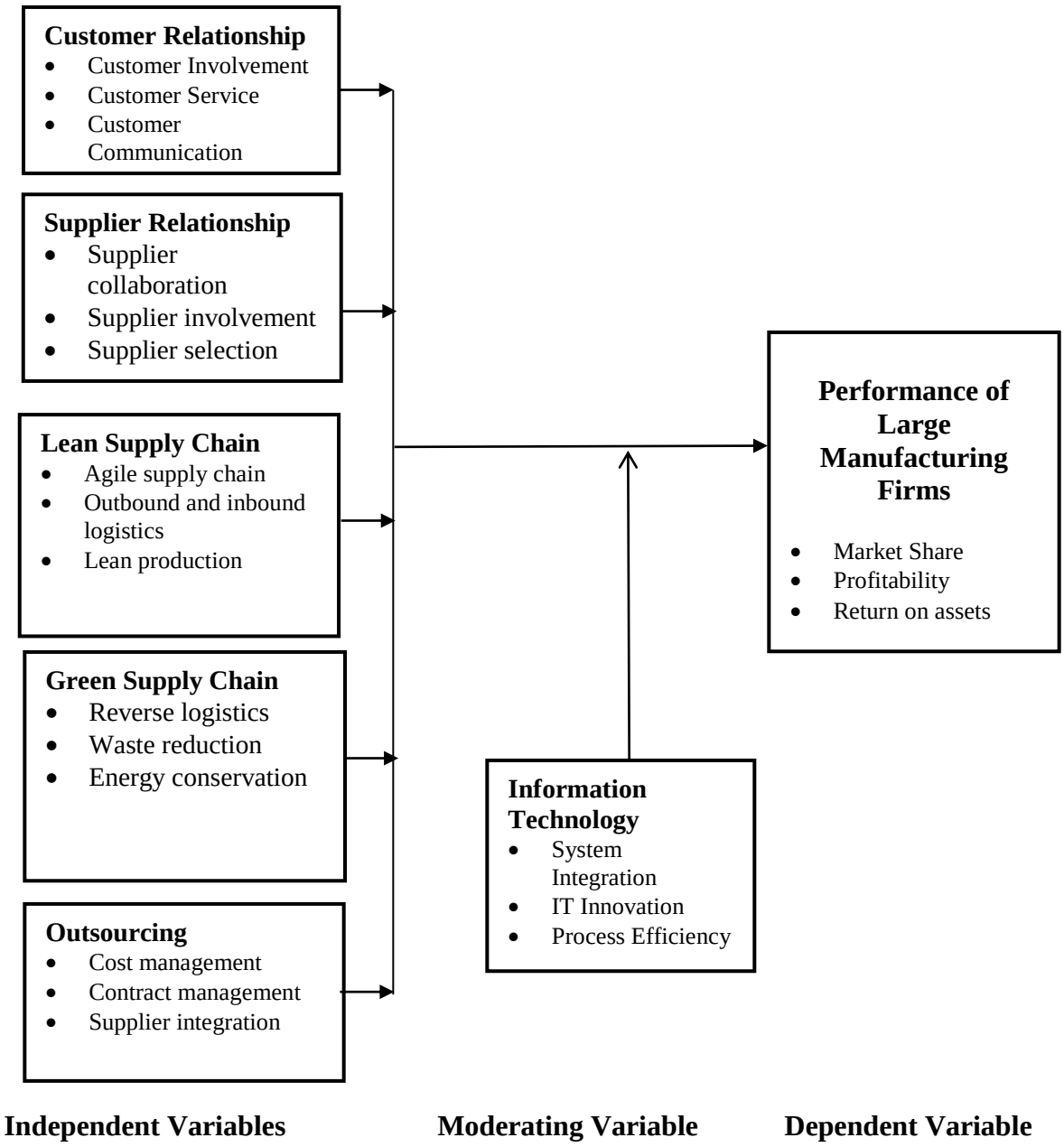

Figure 4.4: Revised Conceptual Framework

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the summary of the main findings, draws conclusions, makes recommendations based on the findings and suggests areas for further studies. The chapter is organized into the following sections: introduction, summary, conclusion, recommendations and areas for further studies. The sections have been done based on the objectives of the study; green supply chain, customer relationship management, supplier relationship management, outsourcing and lean supply chain.

5.2 Summary of Major Findings

The study sought to determine the influence of contemporary supply chain practices on organizational performance in large manufacturing firms in Kenya. The research carried out a comparative study between the various contemporary practices in supply chain and their influence on the organization performance for each practice. The objectives of the study were to determine the influence of green supply chain practices on performance in the large manufacturing firms in Kenya, to determine the influence of supplier relationship practices on performance in the large manufacturing firms in Kenya, to determine the influence of customer relationship management practices on performance in the large manufacturing firms in Kenya, to examine the influence of outsourcing practices on performance in the large manufacturing firms in Kenya, to determine the influence of lean supply chain practices on performance in the large manufacturing firms in Kenya and to establish the moderating effect of information technology on contemporary supply chain practices on performance in the large manufacturing firms in Kenya.

5.2.1 Influence of Customer relationship management on Performance

The study findings indicate that customer relationship management predicted performance in the large manufacturing firms in Kenya. The regression analysis findings indicated a coefficient of determination of 0.483 which implied that 48.3% of the variation in performance of large manufacturing firms in Kenya were as a result of customer relationship management while all other factors contributed to 51.7% of the variation in performance. The findings implied that customer relationship management was therefore an important factor in determining performance of large manufacturing firms. The regression coefficient findings confirm the importance of customer relationship management by indicating that there was a positive significant relationship. This led to the rejection of the null hypothesis and confirming that customer relationship management positively influenced organizational performance of large manufacturing firms.

5.2.2 Influence of Supplier Relationship Management on Performance

The findings of the study indicated that there was a positive significant relationship between supplier relationship management and performance of large manufacturing firms in Kenya. The study realized a coefficient of determination (R^2) value of 0.118 meaning that 11.8% of the variation in performance could be attributed to changes in supplier relationship management in the large manufacturing firms. These findings confirmed that there was a positive significant influence of supplier relationship management on performance of large manufacturing firms. The study therefore rejected the null hypothesis by accepting the alternative hypothesis that supplier relationship management positively influenced performance. The findings implied that supplier relationship management was therefore an important factor in determining performance of large manufacturing firms

5.2.3 Influence of Lean Supply Chain on Performance

The findings of the study indicated that there was a moderate positive relationship between lean supply chain and performance of large manufacturing firms in Kenya. This was realized by a coefficient of determination value of 0.242 indicating that 24.2% of the variation in performance could be attributed to changes in lean supply chain in the large manufacturing firms of Kenya, and 75.8% attributed to other factors other than lean supply chain. The findings were found to be significant as the p values were below 0.05. These findings confirmed that there was a significant influence of lean supply chain on performance of large manufacturing firms in Kenya. The study therefore rejected the null hypothesis and affirmed that there was a positive significant relationship between lean supply chain and performance.

5.2.4 Influence of Green Supply Chain Practices on Performance

The study determined that green supply chain influenced organizational performance. The study found a moderate positive relationship between green supply chain and performance of large manufacturing firms in Kenya. This was confirmed by the coefficient of determination (R^2) value of 0.322 meaning that 32.2% of the variation in performance could be attributed to changes in green supply chain in the large manufacturing firms of Kenya. The regression coefficients realized indicated a positive significant relationship between green supply chain and performance which led to the study rejecting the null hypothesis and affirmed that there was a positive significant relationship between green supply chain and organizational performance in the large manufacturing firms of Kenya. The study therefore held that green supply chain was an important indicator of performance in large manufacturing firms in Kenya.

5.2.5 Influence of Outsourcing on Performance

The findings of the study indicated that outsourcing influenced performance in the large manufacturing firms in Kenya. The study realized a coefficient of determination value of 0.122 which implied that 12.2% of the variation in performance could be attributed to outsourcing in the large manufacturing firms of Kenya. This was also significant given that the p value was less than the 5% significance level set by the study. The regression coefficients showed a significant positive influence of outsourcing on performance of large manufacturing firms. The study therefore deduced that outsourcing influenced organizational performance and thereby rejected the null hypothesis and upheld the research hypothesis that outsourcing had a positive significant influence on performance of large manufacturing firms.

5.2.6 Moderating influence of information technology on the relationship between contemporary supply chain practices and performance

The study conducted a multistage regression analysis of the moderator and realized a coefficient of determination (R^2) of 0.555 before the introduction of information technology as the moderator and 0.584 upon introducing information technology as a moderator. This indicated that when using information technology as a moderator, 58.4% of the variation in performance could be attributed to contemporary supply chain practices. All the coefficient values were significant and therefore the study rejected the null hypothesis and affirmed that information technology positively moderated the relationship between contemporary supply chain practices and performance of large manufacturing firms in Kenya.

5.3 Conclusions

The study aimed at determining the influence of contemporary supply chain practices on organizational performance of large manufacturing firms in Kenya. The study adopted green supply chain, customer relationship management, supplier relationship

management, outsourcing and lean supply chain as the contemporary practices. The study assessed organizational performance in terms of the profitability, level of sales (market share) and return on assets. The study generally found a positive influence of contemporary supply chain practices on organizational performance.

In regard to customer relationship management, the study concludes that the large manufacturing firms in Kenya had heavily invested in customer relationship management practices. This could be attributed to strong relationship between customer relationship management and performance of the firms. Among the aspects of customer relationship management that were widely practiced within the industry included exchange of information with customers, ensuring product visibility within the market and taking incorporating the views of the customers. The study therefore concluded that to realize more profits and consequently higher performance, it is important for organizations to heavily invest in customer service as customer relationship management has shown to have the strongest influence on performance compared to other contemporary supply chain practices in the study.

Concerning supplier relationship management, the study found that supplier evaluation and collaboration was crucial in improving performance of the large manufacturing firms. The study found a strong relationship between supplier relationship management and performance. The study therefore concluded that improved performance was attributed to long term contracts and incorporating capacity issues when selecting suppliers. The study further concluded that supplier relationship can be leveraged by training of suppliers and reward suppliers based on their performance.

In addition, the study found a significant influence of lean supply chain on performance of the large manufacturing firms. This could be attributed to waste minimization, quality management, forecasting and logistics management. The study concluded that efficient and effective application of lean systems led to improved organizational performance in terms of sales and profitability. Further, the study concluded that in order to improve

performance more, there was need to focus on JIT, logistics and streamlining production systems and processes to minimize wastes.

The study found that green supply chain had a positive influence on performance of large manufacturing firms in Kenya. The study found that most of the organizations had implemented architectural designs which allowed natural lighting leading to conservation of energy hence increase in profitability. Also, majority of the organizations had waste management policies in their organizations, meaning that they were conscious of environment impact of waste on performance. The study therefore concludes that for the organizations to realize more value from green supply chain, it's prudent to implement more policies such as use of biodegradable packaging materials and energy generation which will improve performance.

Regarding outsourcing, the study affirmed the contemporary practice of outsourcing non-core functions as a way of improving performance. Among the areas that were found to have a strong influence on performance included formal contracting and supplier evaluation. Outsourcing was found to reduce costs of operations in the firms thereby improving performance. Therefore, the study concluded that outsourcing was viewed as a practice with huge potential of overcoming organizational performance challenges.

Finally, the study concluded that contemporary supply chain practices; green supply chain, customer relationship management, supplier relationship management, outsourcing and lean supply chain when properly implemented leads to higher returns on profitability, market share and return on assets. Further, the study concluded that information technology leverages on the contemporary practices when implemented on all contemporary supply chain practices as opposed to when applied to specific contemporary supply chain practices in the organizations. The study also concluded that performance of the large manufacturing firms depended on the application of green supply chain, customer relationship management, supplier relationship management,

outsourcing and lean supply chain and they needed to be moderated by information technology which act as an integrating factor in leveraging performance.

5.4 Recommendations

Based on the findings and conclusions of the study, the study recommended that all contemporary supply chain practices need to be implemented in organizations as a way of improving performance. Further the study recommends an argumentation of contemporary supply chain practices and information technology systems as a way of leveraging on the output in organizations. In addition, information technology should be applied generally across all the organizational functions, rather than on a few areas in the organization. Information technology is an integrating tool that provides synergy and cooperation across the organization functions and therefore should be applied holistically for the organization to improve its performance.

Correspondingly, the study recommended the adoption of customer relationship management practices as a way of improving and sustaining performance of organizations. The study found a strong positive significant relationship between customer relationship management and performance. The study therefore recommended that there was need to invest in customer relationship management systems involving information technology as the study determined that information technology was a key complement of customer relationship management.

In regard to supplier relationship management, the study recommended that organizations needed to embrace supplier involvement and collaboration in their operations such as in sharing of information, supplier evaluation, contract management and product development. Involvement of suppliers led to improved performance of the organization. The study however determined that organizations lacked mechanisms for training of suppliers, and motivation of suppliers through awards. The study therefore recommended adoption of training and motivation mechanisms. Further, the study

recommended that the organizations needed to hold regular meetings with suppliers in order to share information and create long term relationships.

Similarly, the study recommended the following as far as lean supply chain was concerned; the organizations needed to invest in waste management practices such as avoiding overproduction through forecasting of demand, over processing, unnecessary transportation of goods from one location to the other, overstocking and minimization of defects through quality production. Further, the study recommended adoption of JIT practices that enabled organizations to minimize on lead time as well as reduced inventory costs.

Although the findings on green supply chain were positive towards improving performance of large manufacturing firms, the study identified areas that needed improvement such as energy generation from waste products, use of energy saving techniques, use of biodegradable materials for packaging and improvement on their reverse logistics. The study therefore recommended that the firms should further invest in the three R's of waste management that is, reusing, recycling and reducing wastes. It is also recommended that organizations need to devise architectural designs that are more eco-friendly, use energy efficient machines and equipment as well as focus on improving reverse logistics by investing on returnable containers.

In respect to outsourcing, the study recommended that the organizations needed to outsource their non-core and competent deficient areas. The study found that outsourcing of non-core and competent deficient areas saved costs thereby improving performance. In addition, the study recommended improvement in rewards systems, standards for monitoring and evaluating the services outsourced. The study recommended that before outsourcing is adopted, firms should visit the outsourced partners to evaluate their competencies and capacities to ensure that value is achieved as a result.

The study finally recommended the adoption of holistic information systems that would complement the contemporary supply chain practices such as the use of e-procurement systems, customer relationship management systems, e-tendering systems, e-evaluation systems, quality management systems, inventory management systems, logistics management systems as well as supply chain management systems. The adoption of the systems will depend on the individual needs of the organization, the type of the organization as well the industry needs.

5.5 Areas for Further Study

The study has been able to determine the relationship between contemporary supply chain practices and performance of large manufacturing firms in Kenya. However, there were areas that the study was limited to in terms of scope and methodology applied. The study only focused on five contemporary supply chain practices. It is therefore recommended that future research explore other contemporary supply chain practices such as quality management and risk management and determine their relationship with performance. In addition, the study only covered the large manufacturing sector in Kenya. It is therefore recommended that future research be carried out in other industries such as hospitality, banking, insurance, education, health and findings compared to the present study.

The study used quantitative methods and therefore other studies could adopt qualitative or mixed methods to come up with findings for comparison with the present study. In addition, the study measured performance in terms of ROA, profitability and market share. Therefore, other future scholars can assess performance using other measures such lead time, efficiency, quality and customer satisfaction and corroborate the findings of the present study. Finally, the study adopted information as a moderator. However, the moderation effect was assessed collectively for all variables. Therefore, future scholars can assess the effect of the moderator on the individual contemporary supply chain practices. Further, future scholars should assess whether the relationship between

contemporary supply chain practices and performance can be moderated by other factors such as organizational size and type of leadership.

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APPENDICES

Appendix I: Introduction Letter

Dear Respondent,

I am a PhD student at Jomo Kenyatta University of Agriculture and Technology currently undertaking my research project entitled “Influence of Supply Chain Practices on Organizational Performance in Large manufacturing Firms in Kenya”. The attached questionnaire is for gathering data, which will be useful in the aforementioned research. You have been selected as one of the respondents in this study. I therefore request you to kindly facilitate the collection of the required data by answering the questions herein.

Please note the information sought is purely for academic purposes and will be treated with utmost confidentiality.

I look forward to your co-operation.

Yours faithfully,

Francis Kiarie Memia

Appendix II: Questionnaire

INSTRUCTIONS

The questionnaire is meant to collect information on Influence of Contemporary Supply Chain Practices on Performance of Large manufacturing Firms in Kenya. Your honesty, clarity and willingness to contribute will be highly appreciated. Please tick on the appropriate information. Incase more space is needed use the back of the questionnaire.

Section A: General Information

Kindly provide appropriate responses for the following questions

1. What is your designation?

   Procurement Manager [ ]

   Finance Manager [ ]

   Production Manager [ ]

   Others (Specify) ----------

2. How are the operations in the factory carried out?

   Manual [ ]

   Automated [ ]

   Semi-automated [ ]

Section B: Green Supply Chain

3. To what extent do you agree with the following statements regarding the level of green supply chain adoption in your organization? Please tick as appropriate.

Green Supply chain	Very great Extent	Great Extent	Average	Small Extent	Very Small Extent
The organization has a recycling plant to maximize on its by-products					
The organization has an efficient reverse logistic management system.					
There is a waste management policy in the organization					
The organization uses returnable containers for distribution of the products.					
The packaging materials used are biodegradable					
The organization has a treatment plant for waste management					
The architectural design of the firm allows natural lighting					
The organization is able to generate energy from its waste products					
All electrical equipment and tools are energy efficient					

Section C: Customer Relationship management

4. To what extent do you agree with the following statements regarding the level of customer relationship management adoption in your organization? Please tick as appropriate.

Customer relationship management	Very great	Great Extent	Average	Small Extent	Very Small
The organization exchanges information with its customers					
Customer involvement has helped in product marketing					
The organization involves customers during its product development					
The products are widely available to customers					
The organization has developed training programs for its customers					
The products are well marketed using all forms of media					
The organization incorporates views of customers concerning its products					
There is a formal communication department to address customer issues					
The organization carries out regular customer satisfaction surveys					

Section D: Supplier Relationship

5. To what extent do you agree with the following statements regarding the level of supplier relationship management adoption in your organization? Please tick as appropriate.

Supplier Relationship management	Very great Extent	Great Extent	Average	Small Extent	Very Small
The organization has long term contracts with its main suppliers					
The suppliers are involved in product developments					
The organization shares information with its suppliers					
The organization trains its suppliers					
The organization holds regular meetings with its suppliers					
The organization rewards best performing suppliers					
The organization considers views of their suppliers					
The organization ensures that its suppliers have the right capacity					
Supplier relationship has helped in improving procurement management					

Section E: Outsourcing

6. To what extent do you agree with the following statements regarding the level of outsourcing in your organization? Please tick as appropriate.

Outsourcing	**Very great**	**Great Extent**	**Average**	**Small Extent**	**Very Small**
The organization has saved costs through outsourcing					
The outsourced organization are efficient					
The organization is satisfied with its outsourced services					
The organization has formal contract with its outsourced partners					
The organization frequently evaluates services from outsourced partners					
There are formal standards of outsourcing services across the organization					
The organization rewards best performing outsourced organization					
The organization collaborates well with its outsourced partners					
The organization holds mandatory supplier visits before outsourcing					

Section F: Lean Supply Chain

7. To what extent do you agree with the following statements regarding lean supply chain practices in your organization? Please tick as appropriate.

Lean Supply Chain	Very great Extent	Great Extent	Average	Small Extent	Very Small
The organization practices Just in Time (JIT) procurement					
The organization produces products that are on high demand					
There is minimization of wastage in the organization					
JIT has improved performance of the organization					
The organization has an efficient logistics system					
The organization has streamlined its production and operational processes					
The organization ensures minimal wastes in its operations processes					
The organization produces high quality products to avoid returns					
The firm ensures all products produced satisfy the customer demands					

Section G: Information Technology

Information Technology	Very great Extent	Great Extent	Average	Small Extent	Very Small
The organization has an integrated information system					
The integrated information system has improved supply chain management					
The integrated information system has improved organization performance					
Integrated information system has improved customer relationship management					
Integrated information system has improved supplier relationship					
Integrated information system has led to supply chain innovation					
Integrated information system has led to operational efficiency					
Integrated information system has reduced production timelines					
Integrated information system has improved data management system					

Section H: Performance

8. This section asks questions on performance of your organization as a results supply chain practices. Please fill in the table as appropriate. The period covered is a span of 5 years (2011-2015).

Item	Unit of Measure	2011	2012	2013	2014	2015
Profitability	Kshs.					
Market Share (sales)	Kshs.					
Return on Assets	Percentage (%)					

Appendix III: List of Large manufacturing Firms Listed by KAM

Building, Mining and Construction (20)

1. Athi River Mining Ltd
2. Bamburi Cement Limited
3. Bamburi Special Products Ltd
4. Central Glass Industries
5. Flamingo Tiles (Kenya) Limited
6. Glenn Investments Ltd C/O
7. The Mehta Group Ltd
8. Homa Lime Company Ltd
9. Karsan Murji and Company Limited
10. Kay Salt Ltd Kemu Salt Packers
11. Kenbro Industries Ltd
12. Kenya Builders and Concrete Ltd
13. Malindi Salt Works
14. Manson Hart Kenya Ltd
15. Mombasa Cement Ltd
16. Orbit Enterprises Ltd Saj
17. Ceramics Ltd
18. Savannah Cement
19. Skylark Construction Ltd
20. Wareng Ndovu Enterprises 2005

Chemical and Allied (70)

1. Basco Products (K) Ltd
2. Bayer East Africa Ltd
3. Beiersdorf East Africa Ltd
4. Blue Ring Products Ltd
5. BOC Kenya Limited

6. Buyline Industries Limited
7. Canon Chemicals Limited
8. Canon Chemicals Limited (Former United Chemicals) Ltd
9. Carbacid (CO2) Limited
10. Chemicals and Solvents (EA) Ltd
11. Chrysal Africa Limited
12. Coates Brothers (E.A.) Limited
13. Continental Products
14. Coopers K Brands Ltd
15. Coopers K- Brands Ltd
16. Coopers Kenya Ltd
17. Crown Berger Kenya Ltd
18. Crown Gases Ltd
19. Crown Paints (Kenya) Ltd
20. Darfords Enterprises Ltd
21. Deluxe Inks Ltd
22. Desbro Kenya Limited
23. Diversey Eastern and Central Africa Limited
24. Eastern Chemicals Industries
25. Elex Products Ltd
26. Eveready Batteries East Africa Ltd
27. Faaso Exporters Ltd
28. Galaxy Paints and Coating Co. Ltd
29. Grand Paints Ltd
30. Haco Tigerbrands East Africa Ltd
31. Henkel Kenya Ltd
32. Interconsumer Products Ltd
33. Johnson Diversey East Africa
34. KAPI Limited
35. Kel Chemicals Limited

36. Kip Melamine Co. Ltd
37. Kridha Limited
38. Maroo Polymers Ltd
39. Match Masters Ltd
40. MEA Ltd
41. Metoxide Africa Ltd
42. Milly Glass Works Ltd
43. Murphy Chemicals Ltd
44. Oasis Limited
45. Odex Chemicals Ltd
46. Orbit Chemicals Industries Limited
47. Orbit Enterprises Ltd
48. Osho Chemicals Industries Ltd
49. Pan Africa Chemicals Ltd
50. Polychem East Africa
51. PZ Cussons EA Ltd
52. Reckitt Benckiser (E.A.) Ltd
53. Revolution Stores Ltd
54. Rumorth Group of Companies Ltd
55. S C Johnson and Son Kenya
56. Sadolin Paints (E.A.) Ltd
57. Sanergy
58. Sanergy Limited
59. Soilex Prosolve Limited
60. Strategic Industries Limited
61. Supa Brite Ltd
62. Superfoam Ltd
63. Syngenta East Africa Ltd
64. Synresins Ltd
65. Tata Chemicals Magadi Ltd

66. Tri-Clover Industries (K) Ltd
67. Twiga Chemical Industries Limited
68. Unilever East and Southern Africa
69. Vitafoam Products Limited
70. Westminister Paints and Resins Ltd

Energy, Electricals and Electronics (34)

1. Alloy Steel Casting Ltd
2. Amedo Centre Kenya Ltd
3. Assa Abloy East Africa Limited
4. Aucma Digital Technology Africa Ltd
5. Avery East Africa Ltd
6. Baumann Engineering Limited
7. Biogas Power Holdings (EA) Ltd
8. Centurion Systems Limited
9. East African Cables Ltd
10. Holman Brothers (E.A) Ltd
11. Iberaafrica Power (EA) Ltd
12. International Energy Technik Ltd
13. Karan Biofuel Ltd
14. Kenwest Cables Ltd
15. Kenya Power Ltd
16. Libya Oil Kenya Limited (Formerly Mobil Oil Kenya)
17. Manufacturers and Suppliers (K) Ltd
18. Marshall Fowler (Engineers)
19. Metlex International Ltd
20. Metsec Ltd
21. Mustek East Africa Limited
22. Optimum Lubricants Ltd
23. PCTL Automation Ltd

24. Pentagon Agencies
25. Power Technics Ltd
26. Powerex Lubricants
27. Reliable Electricals Engineers (Nrb) Ltd
28. Socabelec (EA) Ltd
29. Solimpexs Africa Ltd
30. Sollatek Electronics (Kenya) Limited
31. Specialised Power Systems Ltd
32. Synergy-Pro
33. Virtual City Ltd
34. Vivo Energy Kenya Ltd

Food and Beverage (71)

1. Africa Spirits Limited
2. Agriner Agricultural Development
3. Agro Chemical and Food Company Ltd
4. Alpine Coolers Limited
5. Arkay Industries Ltd
6. Belfast Millers Ltd
7. Broadway Bakery Ltd
8. Brookside Dairy Ltd
9. Bunda Cakes and Feeds Ltd
10. Buzeki Dairy Limited
11. C. Dormans Ltd
12. Candy Kenya Ltd
13. Capwell Industries Limited
14. Chirag Kenya Limited
15. Deepa Industries Limited
16. Edible Oil Products
17. Europack Industries Limited

18. Farmers Choice Ltd
19. Githunguri Dairy Farmers Co-Operative Society
20. Global Fresh Ltd
21. Global Tea and Commodities (K) Limited
22. Gonas Best Ltd
23. Green Forest Foods Ltd
24. Happy Cow Ltd
25. Insta Products (EPZ) Ltd
26. Jambo Biscuits (K) Ltd
27. Kabianga Dairy Ltd
28. Kakuzi Ltd
29. Kapa Oil Refineries Limited
30. Kenafric Industries Ltd
31. Kenblest Limited
32. Kenya Nut Company Ltd
33. Kenya Sweets Ltd
34. Kenya Tea Development Agency
35. Kenya Tea Growers Association
36. Kevian Kenya Ltd
37. Kwality Candies and Sweets Ltd
38. Lari Dairies Alliance Ltd
39. London Distillers
40. Mafuko Industries Limited
41. Mayfeeds Kenya Limited
42. Milly Fruit Processors Ltd
43. Mini Bakeries (Nbi) Ltd
44. Mjengo Ltd
45. Mombasa Maize Millers
46. Mount Kenya Bottlers Ltd
47. Mzuri Sweets Ltd

48. NAS Airport Services Ltd
49. Nesfoods Industries Ltd
50. Nestle Foods Kenya Ltd
51. New Kenya Co-Operative Creameries Ltd
52. Nicola Farms Ltd
53. Nutro Manufacturers EPZ Ltd
54. Palmhouse Diaries Ltd
55. Patco Industries Limited
56. Pearl Industries Ltd
57. Pembe Flour Mills Ltd
58. Proctor and Allan (E.A.) Ltd
59. Promasidor Kenya Ltd
60. Sigma Supplies Ltd
61. Spice World Ltd
62. The Breakfast Cereal Company (K) Ltd
63. Unga Group Ltd
64. United Millers Ltd
65. Usafi Services Ltd
66. Valley Confectionery Ltd
67. Valuepak Foods
68. W. E. Tilley (Muthaiga) Ltd
69. Wanainchi Marine Products (K) Limited
70. Wrigley Company (E.A.) Ltd
71. Xpressions Flora Ltd

Fresh Produce (3)

1. Avoken Limited
2. Fontana Limited
3. Maridadi Flowers Ltd

Leather and Footwear (7)

1. Alpharama Limited
2. Bata Shoe Company (Kenya) Ltd
3. Budget Shoes Limited
4. C and P Shoe Industries Ltd
5. Leather Industries of Kenya Limited
6. Sandstorm Africa Limited
7. Zingo Investments Limited

Metal and Allied (66)

1. African Marine and General Engineering Co. Ltd
2. Allied East Africa Ltd
3. Alloy Steel Casting Ltd
4. Apex Steel Limited
5. Apex Steel Limited - Rolling Mill Division
6. Ashut Engineers Ltd
7. ASL Limited- Steel Division
8. ASP Company Ltd
9. Athi River Steel Plant
10. Blue Nile Wire Products Ltd
11. Booth Extrusions Limited
12. Brollo Kenya Limited
13. City Engineering Works (K) Limited
14. Cook? N Lite Ltd
15. Corrugated Sheets Ltd
16. Crystal Industries Ltd
17. Davis and Shirtliff Ltd
18. Devki Steel Mills Ltd
19. Doshi Enterprises Ltd
20. East Africa Glassware Mart Ltd

21. East Africa Spectre Limited
22. East African Foundry Works (K) Ltd
23. Elite Tools
24. Elite Tools Ltd
25. Farm Engineering Industries Limited
26. Friendship Container Manufacturers Limited
27. Friendship Container Manufacturers Ltd
28. General Aluminum Fabricators Ltd
29. Greif East Africa Ltd
30. Hobra Manufacturing Ltd
31. Insteel Limited
32. Kaluworks Ltd
33. Kens Metal Industries
34. Kenya General Industries Ltd
35. Khetshi Dharamshi and Co. Ltd
36. Kitchen King Ltd
37. Laminate Tube Industries Limited
38. Mabati Rolling Mills Limited
39. Marvel Lifestyle Ltd
40. Mecol Limited
41. Metal Crowns Ltd
42. Modulec Engineering Systems Ltd
43. Nail and Steel Products Ltd
44. Nampak Kenya Ltd
45. Napro Industries Limited
46. Narcol Aluminium Rolling Mills Ltd
47. Ndume Ltd
48. Orbit Engineering Ltd
49. Richfield Engineering Ltd
50. Rolmil Kenya Ltd

51. Sheffield Steel Systems Ltd
52. Soni Technical Services Ltd
53. Southern Engineering Co. Ltd
54. Specialised Engineering Co. (EA) Ltd
55. Standard Rolling Mills Ltd
56. Steel Structures Ltd
57. Steelmakers Ltd
58. Steelwool (Africa) Ltd
59. Tarmal Wire Products Ltd
60. Technosteel Industries Limited
61. Tononoka Steel Ltd
62. Vicensa Investments Ltd
63. Viking Industries Ltd
64. Warren Enterprises Ltd
65. Welding Alloys Limited
66. Wire Products Ltd

Motor Vehicle and Accessories (27)

1. Alamdar Trading Company Limited
2. Associated Battery Manufacturers (EA) Ltd
3. Associated Vehicle Assemblers Ltd
4. Auto Ancillaries Ltd
5. Auto Springs Manufacturers Ltd Company
6. Autofine Filters and Seals Ltd
7. Automotive and Industrial Battery Manufacturers
8. Banbros Ltd
9. Bhachu Industries Ltd
10. Chui Auto Spring Industries Ltd
11. CICA Motors
12. Foton East Africa Ltd

13. General Motors East Africa Limited
14. Impala Glass Industries Ltd.
15. Kenya Grange Vehicle Industries Ltd
16. Kenya Vehicle Manufacturers Limited
17. King-Bird (K) Ltd
18. Labh Singh Harnam Singh Ltd
19. Mann Manufacturing Co. Ltd
20. Megh Cushion Industries Ltd
21. Mutsimoto Company Limited
22. Pipe Manufacturers Ltd
23. Sohansons Limited
24. Theevan Enterprises Ltd
25. Toyota Kenya Ltd
26. Unifilters Kenya Ltd
27. Varsani Brakelinings Ltd

Paper and Board (63)

1. Paper House of Kenya Ltd
2. Adpak International Limited
3. Allpack Industries Ltd
4. Andika Industries Ltd
5. Associated Paper and Stationery Ltd
6. Autolitho Ltd
7. Bag and Envelope Converters
8. Bags and Balers Manufacturers (K) Ltd
9. Cempack Solutions Ltd
10. Chandaria Industries Ltd
11. Colour Labels Ltd
12. Colour Packaging Limited
13. Colourprint Ltd

14. D.L Patel Press Ltd
15. De La Rue Currency and Security Print Ltd
16. Dodhia Packaging Limited
17. East Africa Packaging Industries Limited
18. Elite Offset Ltd
19. Ellams Products
20. Ellams Products Ltd
21. English Press Limited
22. Flora Printers Ltd
23. General Printers Limited
24. Graphics and Allied Ltd
25. Guaca Stationers Ltd
26. Highland Paper Mills Ltd
27. Icons Printers Ltd
28. Interlabels Africa Ltd
29. International Paper and Board Supplies Ltd
30. Kartasi Industries Limited
31. Kenafric Diaries Manufacturers Limited
32. Kenya Litho Ltd
33. Kim-Fay East Africa Ltd
34. L.A.B International Kenya Limited
35. Label Converters
36. Manipal International Printing Press Ltd
37. Modern Lithographic (K) Ltd
38. Mufindi Paper Ltd
39. Nation Media Group Limited? Printing Plant
40. National Printing Press Limited
41. Packaging Manufacturers (1976) Ltd
42. Palmy Enterprises
43. Paper House of Kenya Ltd

44. Paperbags Limited
45. Pressmaster Ltd
46. Printing Services Ltd
47. Printpak
48. Printpak Multi Packaging Ltd
49. Printwell Industries ltd
50. Punchlines Ltd
51. Ramco Printing Works Ltd
52. Regal Press Kenya Ltd
53. Sintel Security Print Solutions Ltd
54. Soloh Worldwide InterEnterprises Ltd
55. Stallion Stationary Manufacturers Ltd
56. Standard Group Ltd
57. Statpack Industries Ltd
58. Taws Limited
59. Tetra Pak Ltd
60. The Rodwell Press Ltd
61. Twiga Stationers and Printers Ltd
62. Uneeco Paper Products Ltd
63. United Bags Manufacturers Ltd

Pharmaceutical and Medical Equipment (21)

1. African Cotton Industries Ltd
2. Alpha Medical Manufacturers Ltd
3. Beta Healthcare International
4. Biodeal Laboratories Ltd
5. Biopharma Ltd
6. Cosmos Limited
7. Dawa limited
8. Elys Chemical Industries Limited

9. Gesto Pharmaceuticals Ltd
10. Glaxo Smithkline Kenya Ltd
11. KAM Industries
12. Laboratory and Allied Limited
13. Manhar Brothers (K) Ltd
14. Medivet Products Ltd
15. Novelty Manufacturing Ltd
16. Oss.chemie (K) Limited
17. Pharm Access Africa Ltd
18. Pharmaceutical Manufacturing Co. (K) Ltd
19. Regal Pharmaceuticals Ltd
20. Revital Healthcare (EPZ) Ltd
21. Universal Corporation limited

Plastic and Rubber (68)

1. ACME Containers Ltd
2. Afro Plastics (K) Ltd
3. Betatrad (K) Ltd
4. Bluesky Industries Ltd
5. Bobmil Industries Ltd
6. Brush Manufacturers
7. Cables and Plastics Ltd
8. Canaaneast Company
9. Complast Industries Limited
10. Coninx Industries Ltd
11. Dune Packaging Limited
12. Dynaplas Limited
13. Elgon Kenya Ltd
14. Eslon Plastics of Kenya Ltd
15. Five Star Industries Ltd

16. Fleya Kenya Limited
17. General Plastics Limited
18. Hi-Plast Ltd
19. Jamlam Industries Ltd
20. Jumbo Chem
21. Kamba Manufacturing (1986) Ltd
22. Kenpoly Manufacturers Limited
23. Kenrub Ltd
24. Kentainers Ltd
25. Kenya Suitcase Manufacturers Limited
26. King Plastic Industries Ltd
27. Kinpash Enterprises Ltd
28. L.G. Harris and Co. Ltd
29. Laneeb Plastic Industries Ltd
30. Metro Plastics Kenya Limited
31. Mombasa Polythene Bags Ltd
32. Nairobi Plastics Ltd
33. Ombi Rubber Rollers Ltd
34. Packaging Industries Ltd
35. Packaging Masters Limited
36. Plastic Electricons
37. Plastics and Rubber Industries Ltd
38. Polly Propelin Bags Ltd
39. Polyblend Limited
40. Polyflex Industries Limited
41. Polythene Industries Ltd
42. Premier Industries Limited
43. Prosel Ltd
44. Pyramid Packaging Ltd
45. Raffia Bags (K) Ltd

46. Rubber Products Ltd
47. Safepak Limited
48. Sameer Africa Ltd
49. Sanpac Africa Ltd
50. Shiv Enterprises (E) Ltd
51. Signode Packaging Systems Ltd
52. Silpack Industries Limited
53. Solvochem East Africa Ltd
54. Springbox Kenya Ltd
55. Styloplast Limited
56. Styroplast Limited
57. Sumaria Industries Ltd
58. Super Manufacturers Ltd
59. Techpak Industries Ltd
60. Thermopak Ltd
61. Top Pak Ltd
62. Treadsetters Tyres Ltd
63. Umoja Rubber Products Limited
64. Uni-Plastics Limited
65. Vectus Kenya
66. Vyatu Ltd
67. Wonderpac Industries Ltd
68. Zaverchand Punja Ltd

Services and Consultancy (61)

1. AAM Resources
2. Adafric Communications Ltd
3. African Banking Corporation Ltd
4. Africote Ltd
5. Andest Bites Limited
6. Bank of Africa

7. Basf East Africa Limited
8. Bluekey Software Solution (K) Ltd
9. Bridgeworks Africa Ltd
10. Bureau Veritas Kenya Ltd
11. Capital Colours Creative Design Ltd
12. Citigroup Kenya
13. City Clock (K) Limited
14. Commercial Bank of Africa
15. Compulynx Ltd
16. Corporate Facilities
17. Deloitte
18. DHL Exel Supply Chain Kenya
19. we Manage Africa
20. East African Development Bank
21. Ernst and Young
22. Express Kenya Ltd
23. Grain Bulk Handlers
24. Grofin Kenya Ltd
25. GS1 Kenya
26. Halliday Finch Ltd
27. HTM Capital
28. IDB Capital Limited
29. Industrial and Commercial Dev Corp.
30. Industrial Promotion Services (K) Limited
31. International Supply Chain Solutions Ltd
32. Intersoft Ltd
33. Intertek International Ltd
34. IPS Kenya Ltd
35. Kaizen Institute Africa
36. Kensil Limited

37. Kenya Fire Appliances Co. Ltd
38. Kenya National Cleaner Production Centre
39. Kenya Ports Authority
40. Lean Energy Solutions Ltd
41. Magnate Ventures Ltd
42. Millenium Management Consultants
43. Naushad Trading Company Ltd
44. Panal Freighters
45. Polucon Services (K) Ltd
46. Rongai Workshop and Transport Ltd
47. Safaricom Limited
48. Sevenseas Technology
49. SGS Kenya Ltd
50. Siemens Ltd Kenya
51. Spectrum Network Ltd
52. Standard Chartered Bank (K) Ltd
53. Strategic Value Ltd
54. The Co-Operative Bank of Kenya Limited
55. Tracesoft Limited
56. Transoceanic Project Development Kenya Ltd
57. Tricepts Management Solutions
58. Uchumi Supermarkets Ltd
59. Vehicle and Equipment Leasing Limited
60. Viscar Industrial Capacity Ltd
61. Wotech Kenya Limited

Textile and Apparels (35)

1. Adpack Limited
2. Alltex EPZ Ltd
3. Alpha Knits Ltd
4. Ashton Apparel EPZ Ltd

5. Bedi Investments Limited
6. Brilliant Garments
7. Fantex (K) Ltd
8. Kamyn Industries Limited
9. Kavirondo Filments Ltd
10. Kema (EA) Limited
11. Ken-Knit (Kenya) Ltd
12. Kenwear Garment Manufacturers
13. Kikoy Co. Ltd
14. Le Stud Limited
15. Leena Apparels Ltd
16. Lifeworks Shukrani Limited
17. Longyun Garments
18. Midco Textiles (EA) Ltd
19. New Wide Garments (K) Ltd
20. Ngecha Industries Ltd
21. Senior Best Garments Kenya EPZ Ltd
22. Shin-Ace Garments Kenya (EPZ) Ltd
23. Spin Knit Limited
24. Spinners and Spinners Ltd
25. Squaredeal Uniforms Centre Ltd
26. Straightline Enterprises
27. Summit Fibres Limited
28. Sunflag Textile and Knitwear Mills Ltd
29. Tarpo Industries Limited
30. Teita Estate Ltd
31. Thika Cloth Mills Ltd
32. United Aryan (EPZ) Ltd
33. Vajas Manufacturers Ltd
34. Wildlife Works (EPZ) Ltd

35. World of Kikoys

Timber, Wood and Furniture (17)

1. Comply Industries Ltd
2. Economic Housing Group Ltd
3. Elburgit Enterprises Ltd
4. Fine Wood Works Ltd
5. Furniture International Limited
6. Kenya Wood Limited
7. Newline Ltd
8. Panesars Kenya Ltd
9. PG Bison Ltd
10. Rai Plywoods (Kenya) Ltd
11. Rosewood Furniture Manufacturers
12. Shah Timber Mart Ltd
13. Shamco Industries Ltd
14. Shayona Timber
15. Timber Treatment International Ltd
16. Timsales Ltd
17. Woodtex Kenya Ltd

Appendix IV: Total Variance Explained

	Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Variable		Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Green Supply	1	5.382	59.803	59.803	5.382	59.803	59.803
Chain	2	1.399	15.549	75.352	1.399	15.549	75.352
	3	.887	9.854	85.206			
	4	.505	5.616	90.822			
	5	.310	3.443	94.265			
	6	.238	2.641	96.906			
	7	.155	1.718	98.624			
	8	.099	1.095	99.720			
	9	.025	.280	100.000			
Customer	1	3.934	43.710	43.710	3.934	43.710	43.710
Relationship	2	1.879	20.878	64.588	1.879	20.878	64.588
	3	1.085	12.053	76.641	1.085	12.053	76.641
	4	.847	9.412	86.054			
	5	.725	8.061	94.114			
	6	.209	2.324	96.438			
	7	.185	2.052	98.491			
	8	.105	1.169	99.660			
	9	.031	.340	100.000			
Supplier	1	4.947	54.972	54.972	4.947	54.972	54.972
relationship	2	1.055	11.717	66.689	1.055	11.717	66.689
management	3	.829	9.212	75.901			
	4	.760	8.441	84.342			
	5	.487	5.412	89.754			
	6	.405	4.498	94.251			
	7	.311	3.455	97.706			
	8	.113	1.260	98.967			
	9	.093	1.033	100.000			

Outsourcing	1	3.814	42.376	42.376	3.814	42.376	42.376
	2	1.877	20.859	63.235	1.877	20.859	63.235
	3	.991	11.010	74.245			
	4	.669	7.438	81.682			
	5	.603	6.705	88.387			
	6	.472	5.241	93.628			
	7	.300	3.331	96.959			
	8	.192	2.133	99.092			
	9	.082	.908	100.000			
Lean Supply	1	5.258	58.420	58.420	5.258	58.420	58.420
Chain	2	1.057	11.747	70.167	1.057	11.747	70.167
	3	.812	9.021	79.188			
	4	.710	7.892	87.080			
	5	.403	4.483	91.563			
	6	.285	3.166	94.729			
	7	.261	2.901	97.630			
	8	.134	1.493	99.123			
	9	.079	.877	100.000			
Information	1	4.518	50.199	50.199	4.518	50.199	50.199
Technology	2	1.192	13.245	63.443	1.192	13.245	63.443
	3	1.049	11.656	75.099	1.049	11.656	75.099
	4	.706	7.844	82.943			
	5	.556	6.179	89.122			
	6	.392	4.357	93.479			
	7	.271	3.011	96.490			
	8	.219	2.429	98.918			
	9	.097	1.082	100.000			

Extraction Method: Principal Component Analysis.

Appendix V: Factor Loadings

Green Supply Chain	**Component**	
	1	2
The organization has a recycling plant to maximize on its by-products	.890	.212
The organization has an efficient reverse logistic management system.	.931	.061
There is a waste management policy in the organization	.819	.406
The organization uses returnable containers for distribution of the products.	.748	.125
The packaging materials used are biodegradable	.783	.275
The organization has a treatment plant for waste management	.911	.218
The architectural design of the firm allows natural lighting	.415	.510
The organization is able to generate energy from its waste products	.905	.042
All electrical equipment and tools are energy efficient	.246	.886

Customer relationship management	**Component**		
	1	2	3
The organization exchanges information with its customers	.636	.246	.302
Customer involvement has helped in product marketing	.776	.318	.464
The organization involves customers during its product development	.639	.546	.418
The products are widely available to customers	.525	.360	.626
The organization has developed training programs for its customers	.594	.669	.168
The products are well marketed using all forms of media	.281	.821	.298
The organization incorporates views of customers concerning its products	.857	.036	.005
There is a formal communication department to address customer issues	.671	.203	.138
The organization carries out regular customer satisfaction surveys	.791	.354	.276

Supplier Relationship Management	**Component**	
	1	2

The organization has long term contracts with its main suppliers	.477	.480
The suppliers are involved in product developments	.877	.078
The organization shares information with its suppliers	.812	.079
The organization trains its suppliers	.842	.283
The organization holds regular meetings with its suppliers	.699	.637
The organization rewards best performing suppliers	.690	.448
The organization considers views of their suppliers	.840	.257
The organization ensures that its suppliers have the right capacity	.640	.197
Supplier relationship has helped in improving procurement management	.708	.144
Outsourcing	**Component**	
	1	2
The organization has saved costs through outsourcing	.802	.092
The outsourced organization are efficient	.561	.607
The organization is satisfied with its outsourced services	.617	.475
The organization has formal contract with its outsourced partners	.260	.615
The organization frequently evaluates services from outsourced partners	.617	.548
There are formal standards of outsourcing services across the organization	.819	.014
The organization rewards best performing outsourced organization	.761	.354
The organization collaborates well with its outsourced partners	.433	.639
The organization holds mandatory supplier visits before outsourcing	.768	.249
Lean Supply Chain	**Component**	
	1	2
The organization practices Just in Time (JIT) procurement	.848	.030
The organization produces products that are on high demand	.757	.159
There is minimization of wastage in the organization	.534	.671
JIT has improved performance of the organization	.807	.303
The organization has an efficient logistics system	.892	.028
The organization has streamlined its production and operational processes	.788	.074

The organization ensures minimal wastes in its operations processes	.603	.482
The organization produces high quality products to avoid returns	.908	.027
The firm ensures all products produced satisfy the customer demands	.651	.500

Information Technology

	Component		
	1	**2**	**3**
The organization has an integrated information system	.703	-.139	-.126
The integrated information system has improved supply chain management	.731	-.485	.351
The integrated information system has improved organization performance	.714	-.401	.350
Integrated information system has improved customer relationship	.716	.213	.424
Integrated information system has improved supplier relationship	.603	.646	.321
Integrated information system has led to supply chain innovation	.734	.401	-.054
Integrated information system has led to operational efficiency	.688	-.080	-.361
Integrated information system has reduced production timelines	.719	.248	-.484
Integrated information system has improved data management system	.757	-.292	-.370

Extraction Method: Principal Component Analysis.