

**CONTRIBUTIONS OF SUPPLY CHAIN
MANAGEMENT PRACTICES ON PERFORMANCE OF
STEEL MANUFACTURING COMPANIES IN KENYA**

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**Contributions of Supply Chain Management Practices on the
Performance of Steel Manufacturing Companies in Kenya**

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of Philosophy in Business Administration (Procurement & Supply
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DECLARATION

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

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DEDICATION

This thesis is specifically dedicated to my Mum Beatrice Nasimiyu Barasa for believing in me and never giving up on me even when I didn't believe in myself. I would like to thank my wife Carolyne Naliaka and my children; Einstein Wafula, Yvonne Nasimiyu, Ivy Ruth Nekesa, Stacy Nasambu and Mary Stephanie Nafula for their unconditional love and unwavering support.

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LIST OF ABBREVIATIONS & ACRONYMS

| | |
|--------------|--|
| ACTIP | Advisory Council for Trade and Innovation Policy |
| ANOVA | Analysis Of Variance |
| CRM | Customer Relationship Management |
| ERP | Enterprise Resource Planning |
| GDP | Gross Domestic Product |
| GSCM | Green Supply Chain Management |
| ICT | Information Communication Technology |
| IS | Information Sharing |
| ISO | International Organization for Standardization |
| KAM | Kenya Association of Manufacturers |
| NPC | National Planning Commission |
| SCC | Supply Chain Collaboration |
| SCM | Supply Chain Management |
| SRI | Socially Responsible Investment |
| UNIDO | United Nations Industrial Development Organization |

DEFINITION OF TERMS

- Product Quality-** It is the extent to which the company product is able to meet stakeholder expectations on certain dimensions that have value for them (Saner & Eijkman, 2005).
- Performance –** It is a set of financial and nonfinancial indicators which offer information on the degree of achievement of objectives and results (Lebans & Euske, 2006)
- Supply Chain Collaboration –** It is the construct of coordination, participation and joint problem solving between supply chain partners (Stank *et al.*, 2001)
- Supply Chain Responsiveness –** It is the ability to react purposefully and within an appropriate time-scale to customer demand or changes in the marketplace to bring about or maintain competitive advantage (Holweg, 2005).
- Supply Chain Management –** It is a philosophy of management that involves the management and integration of a set of selected key business processes from end user through original suppliers, that provides products, services, and information that add value for customers and other stakeholders through the collaborative efforts of supply chain members (Ho *et al.* 2002).

ABSTRACT

The main purpose of this study was to examine the contributions of supply chain management practices on performance of Steel Manufacturing Companies in Kenya which are the key contributors to the economic development of the country. The specific objective of the study were; to determine the contributions of supply chain collaboration practice on performance of steel manufacturing Companies in Kenya; to examine the contributions of green supply chain management practice on performance of steel manufacturing Companies in Kenya; to investigate the contributions of information sharing practice on performance of Steel Manufacturing Companies in Kenya; to find out to what extent does customer relationship management practice contributes to performance of steel Manufacturing Companies in Kenya and lastly provide recommendations on how to improve supply chain performance of Steel Manufacturing Companies in Kenya. The metrics for measuring the company's performance were the quality of product and customer satisfaction. The descriptive research design was used in the formulation of knowledge on the contributions of supply chain management practices on performance of Steel manufacturing Companies in Kenya and provided solutions to areas that needed improvement. Structured questionnaires and oral interviews research techniques were used to get primary data from employees in production department, marketing department, Information Technology department and Supply chain department while scheduled interviews was used for firm's procurement managers. Analytical research method was used to analyze secondary data and ex-post facto research design was used to report things the way they are. Both quantitative and qualitative research techniques were used during data presentation using inferential statistics to draw conclusions from the nominal measurement scale. Purposive sampling technique was used to identify and select eligible participants for the study sampling since it allowed the researcher to choose subjects who are in the best position to provide information required. The null hypothesis formulated was that supply chain management practices contribute to performance of steel manufacturing companies in Kenya. The sample size was determined using Cochran sampling frame for large population. The correlation analysis was carried out between the variables of the study using Pearson correlation coefficient and the null hypothesis was tested by use of F- ratio using a two way Fisher's Analysis of Variance [ANOVA] on assumption of the homogeneity of the variance of the sample that is normally distributed at 95% confidence interval. The study found that supply chain management practices that include; supply chain collaboration practice, Green supply chain management practice, information sharing practice and Customer relationship management practice statistically significantly predicted the performance of Steel manufacturing companies in Kenya. The study recommends that the Steel manufacturing companies in Kenya should incorporate the supply chain management practices in their business operations to enhance their supply chain performance.

CHAPTER ONE

INTRODUCTION

1.1 Background

With globalization, there has been an increasing interdependence across national and geographical boundaries of people. The intensity of competition has increased tremendously and there has been growing demands for flexible and cost efficient systems that can support customer differentiation (Barasa, 2014). There are increasingly complex consumer demands, changing global regulatory regimes and increased concerns over products safety and security. Import restrictions have been put on the companies that fail to manage sustainably its supply chain and with the emergence of new types of inter-organizational relationships, Companies in most cases have been confronted with the challenge of having to plan and monitor their material and information flows continuously and efficiently from the point of procurement, through production and up to marketing. In manufacturing industry, the demands from customers always vary and it is hard to anticipate. Customers are used to requiring products in a short time frame whenever they increase demand without prior alignment with the company's production plans. In order to cope with these challenges, majority of companies have entered a new era in understanding the dynamics of competitive advantage and the role played by supply chain management (Premkumar *et al.*, 2003).

Supply chain management is applied by companies across the globe due to its demonstrated results such as delivery time reduction, improved financial performance, greater customer satisfaction and building trust among suppliers. Effective supply chain management (SCM) has become a potentially valuable way of securing competitive advantage and improving organizational performance since competition is no longer between organizations, but among supply chains (Suhong *et al.*, 2006). It involves bringing the right amount of right product to the right place at the right time while minimizing related cost within and between all parties (Saad *et al.*, 2002). Chopra and Meindl (2015) asserts that Supply chain management is about

competing for value, collaborating with customers and suppliers to create a position of strength in the market place based on value derived from end consumer. The companies need to create strong supply chain relationships that enable them to leverage their market orientations by responding to rapid changes in customers' value and competitor moves for them to acquire superior business performance (Martin & Grbac, 2003).

A closer relationship among the supply chain members enables them to achieve cost reductions and profitability as well as flexibility in dealing uncertainties in supply chain. Steel Manufacturing Companies have become more responsive to customers in order to ensure their supply chain operate with the absolute minimum of stock-out events, with prompt response to market fluctuations while at the same time carrying minimal buffer stocks. The Steel industry globally has many players that make business coordination in this industry very difficult since in most cases steel producers and consumers depend on intermediaries to help in buying and selling materials (Goodwin *et al.*, 2000). The Steel industry is a high capital intensive and their products have relative long life-cycles, which means that low cost production is a prerequisite for any of this companies to become a market winner and they cannot rely on increased prices to ensure their profitability (Standard & Poor's, 2007).

Steel products are majorly produced in Developed Countries that includes China, USA, Japan, Russia, Germany, India and Korea. Globally, the level of steel consumption is considered as an indicator of the status of industrial development in any Country. Kenya is endowed with huge deposits of iron ore and limestone which have been found in large quantities in Homa Bay, Kitui, Kakamega and Taita Taveta. Recognizing the country potential in the development of steel industry, the government of Kenya embarked on a mission to lure the Korean Steel and Iron Manufacturer (POSCO) to invest US\$153 Million in steel and iron production factory in the year 2011 (ACTIP, 2011). National steel demand in Kenya is estimated to be 1.8 million metric tonnes per year and expected to grow to 2.5 million metric tonnes by the year 2020 and double that number by 2030, of which about 10% was imported from South Africa. With high demand of steel and with unexploited raw

materials for manufacturing of steel in the country, players in the steel industry are responding to this demand with multimillion shilling investment plans in steel plants in various parts of the country. Tarmal Wire Products Ltd. opened a new rolling mill with a capacity of 84,000tonnes per year in late 2011. Devki Steel Mills Ltd. a subsidiary of Devki Group of Companies produced about 250,000tonnes per year from its three steel plants (Odhiambo, 2011; Kenya Engineer, 2012).

The government envisages that the creation of iron and steel industry will contribute to the enhancement of economic progress, social cohesion and political stability in line with the aspirations of vision 2030 (NPC, 2011). These will assist the government to realize the growth targets for manufacturing industry that is clearly stated in Kenya vision 2030 document that require an increasing investment levels to reach above 30% of GDP (Kenya vision 2030, 2007). Kenyan Steel Manufacturing companies mainly export their products to the countries like Rwanda, Tanzania, Uganda, Burundi, Southern Sudan and Democratic Republic of Congo and Kenya imports about 240,000 metric tonnes per year of iron ore from China, India, the Republic of Korea, and South Africa. For these companies to remain competitive in the global market, they need to incorporate the best supply chain management practices in their management processes.

1.2 Statement of the Problem

The main dimensions of an effective supply chain include strategic collaboration with suppliers, customer relationship management and the level of information sharing among the supply chain partners. Kim (2006) argues that the major goal of supply chain management is to enhance competitive performance by integrating the internal functions within a company and linking them closely with the external operations of suppliers, customers and other members of the supply chain network. Information flow in any supply chain helps to coordinate the physical flows and the interdependencies amongst the organizations in the supply chain (Shah, 2009). Collaboration of supply chain enables the cooperating members in the supply chain to improve performance of the organization in terms of revenue improvement, cost

reductions, operational flexibility and to cope with high demand uncertainties (Simatupang & Sridharam, 2005).

Kenyan steel manufacturing companies have been exposed to global competition with the liberalization of the East African regional markets that were key importers of the Kenyan Steel products. The steel manufacturing companies from developed countries like China, Korea, Japan, USA and Russia have ensured that they compete in terms of cost, quality, technology, customer satisfaction and other competitive strategies as they pursue to achieve competitive advantage over the Kenyan Steel products. These Companies are also facing the challenges of high cost of raw materials, poor transport network, high taxation, price volatility and high cost of energy that hinder them to compete favorably (KAM, 2012). This has posed as a challenge to managers in steel manufacturing companies in Kenya as they strive to achieve competitive advantage in regional and global markets. With considerable empirical research on supply chain management as well as models aimed at solving problems experienced by business firms, managers in most organizations are trying to implement the important supply chain management concepts to ensure that they achieve the combined benefits of improved cost, flexibility, dependability and quality (Hayes *et al.*, 2005). Manufacturing companies in developing countries in which Kenya is also included are now increasingly integrating the supply chain management practices in their business operations to ensure that they also compete favorably in the dynamic global market.

Although a number of studies have been done on the concept and context of supply chain management practices in Kenya, there is limited information within the context of Steel Manufacturing industry in Kenya. Okanda, Namusonge and Waiganjo (2016) investigated the influence of supply planning practice on the performance of the unit of vaccines and immunizations in the Ministry of health, Kenya and found out that supply planning practices such as optimum inventory procurement, determination of health requirements of health facilities at every node, aggregate determination requirements and joint coordination with suppliers if adopted by the unit of vaccines and immunizations will increase the performance positively while

Arani *et al.* (2016) investigated the influence of strategic sourcing on supply chain resilience in manufacturing firms in Kenya. Okello and Were (2014) explored the influence of supply chain management practices on performance of the selected NSE listed food manufacturing companies in Nairobi Kenya and the study revealed that product development process, inventory management, lead time, technology and innovation have a significant influence on the performance of food manufacturing companies in Kenya. Gichuru, Iravo and Arani. (2015) carried out an empirical investigation on influence of Collaborative Supply Chain Practices on Performance of Food and Beverages Companies. The study found out that information sharing practice and resource sharing practice has positive influence on the performance of the company. Similarly, Kimani (2013) explored the influence information technology, supply chain design, people issues and collaboration issues on the implementation of effective supply chain management and found out that all four independent variables have high effect on implementation of effective SCM in the petroleum sector. Amemba *et al.* (2013) did a study on elements of green supply chain management and established Green Supply Chain Management leads enhanced production efficiency and reduced wastage leading to better economic performance of the organization.

These studies didn't explore the contributions of supply chain management practices that include supply chain collaboration practice, information sharing practice, green supply chain practice and customer relationship management practice on the performance of steel manufacturing companies in Kenya. Also most of the above studies used financial measures of performance and hence the need for a study to be carried out focusing on Steel manufacturing industry in Kenya and also applying non-financial measures to measure the organization performance.

1.3 Research Objectives

1.3.1 General Objective

The general objective of the study was to assess the contributions of supply chain management practices on performance of steel manufacturing Companies in Kenya

1.3.2 Specific Objectives

The research study aimed at achieving the following specific objectives:

1. To determine the contribution of supply chain collaboration practice on performance of steel manufacturing Companies in Kenya
2. To examine the contribution of green supply chain management practice on performance of steel manufacturing Companies in Kenya.
3. To investigate the contribution of information Sharing practice on performance of Steel Manufacturing Companies in Kenya.
4. To find out the extent customer relationship management practice contributes to the performance of Steel Manufacturing Companies in Kenya.

1.4 Research Questions

The study was guided by the following research questions:

1. What is the contribution of supply chain collaboration practice on performance of steel manufacturing Companies in Kenya?
2. Do what extent does Green supply chain management practice contributions to performance of steel manufacturing Companies in Kenya?
3. What is the contribution of Information sharing practice on performance of Steel Manufacturing Companies in Kenya?
4. Do what extent does customer relationship management practice contributes to performance of Steel Manufacturing Companies in Kenya?
5. What are the recommendations on improving supply chain performance of Steel Manufacturing Companies in Kenya?

1.5 Research Hypotheses

The study aimed at testing the following null hypotheses:

H₀₁: There is a significant contribution of Supply chain collaboration practice on performance of steel manufacturing Companies in Kenya.

H₀₂: There is significant relationship between green supply chain management practice and the performance of steel manufacturing Companies in Kenya.

H₀₃: Information sharing practice contributes significantly on performance of steel manufacturing Companies in Kenya.

H₀₄: Customer relationship management practice contributes significantly on performance of Steel Manufacturing Companies in Kenya.

1.6 Justification and Significance of the Study

This section explains the justification and significance of carrying out the study on the contributions of supply chain management practices on performance of Steel Manufacturing Companies in Kenya

1.6.1 Justification of the study

There has been increased customers demand for the Steel Manufacturing Companies to provide high quality products at a lowered cost and ensure flexible delivery in the global market. The trend has not been different in Kenya and with the liberalization of Kenyan market and other markets in the Eastern and Central African countries; the Kenya Steel manufacturing Companies have been experiencing stiff competitions from Multinational Companies that offer high quality products and at a lowered cost.

The rationale for carrying out the study was to assess the contributions of supply chain management practices on performance of steel manufacturing companies in Kenya and propose some policy recommendations to be incorporated in their operations for them to deliver greater customer performance, lowered cost and improved product quality so as to compete favorably in the global market.

1.6.2 Significance of the Study

This study will benefit the following;

a. Policy makers

The information will be used by Kenyan Policy makers in government and private sectors to come up with strategies and policies that ensure the Steel manufacturing Companies in Kenya compete favorably in the global market in sustainable manner by meeting both environmental and quality requirements. Government will be able to come up with trade and tariff policies that promote and protect the development of steel manufacturing companies in Kenya.

b. Academic Research Institutions

The study will provide a theoretical and empirical framework for research in Supply Chain Management Practices with Steel Manufacturing Companies in Kenya and will contribute to the body of knowledge since it will be reference material for future researchers and academicians. They should find the study methodology and subsequent results rich enough to guide future research. Further, the study will act as an impetus to reignite interest in this critical area of study.

c. Management of Steel Manufacturing Companies

The study findings will be of great importance to the management of Steel Manufacturing companies since it will make them to reevaluate their supply chain management practices and ensure that they build customer feedback in to their business operations by improving their information communication systems, standardize processes and products, empower and train workers on critical skills that will make them achieve high level of performance. The findings will help managers to strategy on how to reduce the negative environmental consequences by producing, moving and storing products in the supply chain by use of recycling and managing returns along supply chain. Increased knowledge of the

supply chain management practices and incorporating such practices in their companies will help them to reducing purchasing cost, reduce excess inventories and reduce costs associated with non-value adding activities leading to improved performance of the company.

d. Government

The government will use the information to set up standards governing the manufacturing processes and develop physical infrastructure that will promote steel manufacturing industry such as Power installations, cyber optic cables for e-commerce, rail and road infrastructures. The government will use the information to guide the industry in terms of international trade, taxation and environmental regulations. It will help the government to develop the right skilled workforce to work in the Steel manufacturing companies.

e. Community

The community is the consumers and suppliers to Steel manufacturing companies and is directly or indirectly affected by the operation of these companies. The companies that incorporate Supply chain management practices are able to be responsive to customers changing needs that include clean environment and quality products. They will also benefit from reduced prices as a result of reduced operation costs and local sourcing of materials and professional services. Additional community benefits that may arise as a result of good performance of steel manufacturing companies may include charitable donations, bursaries, community projects and facilities and support for local community services.

1.7 Scope of the Study

The study focused on all the Steel manufacturing companies in Kenya from which a sample of 32 companies was drawn. The procurement managers were the key respondents in this study. The study was conducted in the republic of Kenya and most of these steel manufacturing companies are located in Nairobi and Mombasa Cities in Kenya.

Kenya was chosen because it is the East and Central Africa's biggest economy and has posted tremendous growth in the service sector, boosted by rapid expansion in telecommunication and financial activity over the last decade. Although the country is the most industrially developed in East and Central Africa, manufacturing industry still accounts for only 13 percent of the GDP. The country has 258 registered steel and metal products manufacturers who export an average 122,000 metric tonnes of metal and steel products valued at over Sh4 billion annually (Odhiambo, 2011). Kenya has huge deposits of iron ore and limestone which have been found in large quantities in Homa Bay, Kitui, Kakamega and Taita Taveta (ACTIP, 2011), these sources of raw materials are crucial for the development of Steel industry in the Country.

The country lies on the equator with the Indian Ocean to the south-east, Tanzania to the south, Uganda to the west, South Sudan to the north-west, Ethiopia to the north and Somalia to the north-east and being a member of East African Community (EAC) and Common Market for Eastern and Southern Africa (COMESA). These countries have been the major importer of the Steel Products manufactured in Kenya and hence the need to assess the contributions of supply chain management practices on performance of steel manufacturing companies in Kenya.

1.8 Limitations of the Study

This study adopted a cross-sectional survey and this was one of the main limitation of the study since the researcher could not corroborate cross-sectional findings and examine performance prior to and after implementation of SCM practices at different time periods in order to provide insights into the refinement of the pertinent items. A longitudinal study examining the development of performance for longer period of time should be considered in future research.

Secondly, the response of the respondents limited the study results particularly the freedom which respondents felt in disclosing their opinions about Supply Chain Management practices in their company thinking that they may be reprimanded by management of their companies. These made it hard to get information from some

Companies that were reluctant to participate in the research for fear that the information will be shared by government agencies despite being assured of the confidentiality. Also the study relied largely on quantitative methodology of data collection by use of questionnaire with limited extent qualitative methodology hence making it a bit restrictive. Therefore, more of qualitative methodology of data collection should be undertaken in future to provide wider perspective to the study.

The study also was based on a self-reported questionnaire and therefore there was a possibility of respondents answering questions in a way that is perceived to be desirable to them than the actual reality. The study could not include other key stakeholders in steel manufacturing industry like suppliers, customers, civil society and the ministry of industrialization who also have interest in the sector and their opinions could have assisted in the making of final recommendations.

Finally, the study was on Steel Manufacturing companies in Kenya and single sector may not be generalized to other sectors. Future research should consider multiple industries or sectors to increase the understanding of the contributions of Supply chain management practice on performance.

The researcher dealt with the challenges by attaching cover letter on the questionnaire helped in assuring respondents that information given will be anonymous and confidential. They also made follow up through the phone calls and making several physical visits to the respondents trying to ensure that respondents complete the questionnaire and providing assistance where necessary. Also the use of standardized questionnaire helped to increase the response rate. The researcher made use of journals, textbooks and internet to gather additional information on steel manufacturing companies in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter deals with theoretical and empirical analysis of literature on supply chain management practices. It discusses the theoretical framework, conceptual framework, Supply chain management practices that include Supply chain collaboration practice, Green supply chain management practice, Information sharing practice and customer relationship management practice. Finally, critique of existing literature on supply chain management practices, research gaps and summary of the literature will be discussed.

2.2 Theoretical Framework

The study reviewed the following theories; The Supply Chain Management Theory, the lean supply chain theory, The Agile supply chain Theory and Supply Chain Integration Theory.

2.2.1 Supply Chain Management Theory

Supply chain has its roots in Porter's (1985) value chain, which is the set of processes a firm uses to create value for its customers. Although originally described as a chain, supply chain can nowadays be defined as the network of organizations that are involved through upstream and downstream linkages in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer (Christopher, 2005).The chain involves two or more legally separated organizations that are linked together by material, information or financial flows and includes the ultimate customer.

The objectives of the supply chain are to provide service to customers, achieve low operating costs and minimize the assets in the chain (Skjøtt-Larsen *et al.*, 2007). Many companies are now looking at securing cost, quality, technology and other

competitive advantages as strategies to pursue in a globally competitive environment and to achieve this many manufacturers are focusing on their supply chain management practices.

Supply chain management is an important multi-disciplinary topic in modern business management and research. It enhances organizational productivity and profitability through a revolutionary philosophy to managing the business with sustained competitiveness (Gunasekaran *et al.*, 2004). Supply chain management emphasizes the overall and long-time benefit of all parties in the supply chain through co-operation and information sharing (Yu *et al.*, 2001). Simchi-Levi *et al.* (2009), define Supply chain management as a set of approaches used to efficiently integrate suppliers, manufacturers, warehouses and stores so that products are produced and distributed at the right quantities, to the right locations, and at the right time in order to minimize system-wide costs while satisfying service-level requirements.

Supply chain management aims at linking each element of the manufacturing and supply processes from raw materials acquisition, processing of goods and up to the final end users of the product. It focuses on how firms utilize their suppliers' processes, technology and capability to enhance competitive advantage. Supply Chain Management has the objective of governing all parts of the supply chain as a unit, instead of single organizational elements, in order to achieve increased competitiveness (Stadtler & Kilger, 2008). Since satisfying customer needs is the central purpose of any business (Doyle & Stern, 2006), this framework reflects the notion that customer focus in terms of satisfying needs and providing timely service is a key driving force of effective supply chain management. It seeks improve performance through better use of internal and external capabilities in order to create a seamlessly coordinated supply chain, thus elevating inter-company competition to inter-supply chain competition (Lummus *et al.*, 2003).

2.2.2 The Lean Supply Chain Theory

Lean supply chain management is a set of organizations directly linked by upstream and downstream flows of products, services, finances and information that collaboratively work to reduce cost and waste by efficiently and effectively pulling what is required in meeting the needs of the individual customer. Lean thinking in the supply chain is the use of lean principles to align activities across corporate functions within the firm and to manage business relationships with customers and suppliers (Lambert 2008). The core concept of lean thinking is the Japanese term *muda* exemplified by the practices of Japanese motor manufacturing (Lysons & Farrington, 2012). Muda means waste or any human activity that consumes resources but creates no value. In the lean paradigm, activities that consume resources but generate no redeeming value in the eyes of the consumer are waste that must be eliminated (Womack & Jones, 2003).

Manrodt and Vitasek (2008), defined lean as a systematic approach to enhancing value to the customer by identifying and eliminating waste through continuous improvement by flowing the product at the pull of the customer in pursuit of perfection. It calls for organizations to analyze business processes systematically to establish the value adding processes and identify the incidence of this waste (Harrison & Van Hoek, 2011). Lean Supply chain seeks to reduce wastes found anywhere in the supply network, standardizes processes across traditional, vertical organizations, and optimizes core resources. The non-value adding activities in manufacturing companies includes overproduction, waiting wastes, inappropriate processing, unnecessary inventory, unnecessary motion by operators and waste due to defects.

Lean Supply chain emphasizes on utilization of less time, less space, less inventory and even less money to produce products. It basically focuses on the elimination of seven types of wastes that are overproduction, waiting, transportation, inventory, defective units and over-processing. Lean production is an integrated activity in Supply chain management designed to achieve high-volume, flexible production using minimal inventories of raw materials. It is derived from the need to increase

product flow velocity through the elimination of all non-value adding activities (Arnheiter & Maleyeff, 2005). Lean production is based on the premise that nothing will be produced until it is needed. It is implemented throughout the supply chain with the signal moving backward from the customer all the way back to the most basic raw materials (Davis & Heineke, 2005).

The main objectives of implementing the lean supply chain in an organization is improve flexibility, reduced cost, high inventory turns, shorter lead time and defect prevention. Lean supply chains seek to create customer-winning value at the lowest cost through the real-time synchronization of product/service needs with the optimum supplier. Borac *et al.* (2010), lean has become a strategic method for gaining competitive advantage and even for survival not just for manufacturers but also for retailers and wholesalers.

The most popular example of lean manufacturing is the Toyota Production System that attributes supply chain success to ability to achieve economies of scale in manufacturing and procurement based on small batch size production units (Holweg, 2007). Lean supply chains consider cash-to-cash cycle times as a critical measure of performance. The longer it takes to convert inventories into cash the more working capital is required and any reduction in this measure will mean the release of working capital and hence a reduction in cost (Christopher & Gattorna, 2005).

2.2.3 The Agile Supply Chain Theory

The market environment has become more dynamic and turbulent; companies need to adopt new supply chain strategy for them to remain competitive. Supply chain management is now moving away from traditional processes to agile capability of competitive bases of speed, flexibility, innovation, quality, and profitability through the integration of reconfigurable resources and best practices in a knowledge-rich environment to provide customer-driven products and services in a fast changing market environment (Yusuf *et al.*, 2004).

Agility is a business-wide capability that embraces organizational structures, information systems, logistics processes and in particular, mindsets (Christopher, 2000). Lee (2004) argues that supply chain agility aims at responding quickly to short-term changes in demand or supply and ensure that the company handles external disruptions smoothly. Christopher (2000) identified four characters of agile supply chain that included sensitivity, virtuality, process integration and network based. Process integration means collaborative working between buyers and suppliers, joint product development, common systems and shared information.

Agile supply chain is market sensitive and needs the supply chain members to be able to read and respond to the market demand. The supply chain members should show the willingness to create an environment in which information can flow freely in both directions in the chain for them to achieve a more agile supplier base. Christopher (2000) argues that leveraging supplier relations allows companies to create agile supply chains by reducing lead time between organizations. The leverage of respective strengths and competencies of network partners assists to achieve greater responsiveness to market needs (Christopher, 2000). Krajewski *et al.* (2009) asserts that efficient supply chain has the qualities of make to stock, low capacity cushion, low inventory investment, short lead time, emphasis low process with consistent quality and on time delivery while for responsive supply chain include assemble to order with emphasis on product variety operational strategy, high capacity cushion, just as needed inventory to enable fast delivery time, shorten lead time and emphasis on fast delivery time, customization, and flexibility. It is through information sharing and collaboration that the company as a whole will have responsibility in assisting its external suppliers to improve quality, delivery time and service performance. This requires real time market feedback on actual customer requirements without making forecasts based upon past sales or shipments.

The use of information technology has helped the organizations to capture data on demand through Efficient Customer Response (ECR) from point –of –sale or the point of use hence increasing the responsiveness in process industries. Efficient Customer Response (ECR) is designed to integrate and rationalize product

assortment, promotion, new product development and replenishment across the supply chain hence increasing emphasis on key areas such as EDI, cross-docking and continuous replenishment (Harrison & Van Hoek, 2008). Implementing e-business to streamline business processes provide windows into operations, integrating the supply chain, increase customer services and streamline distribution (Rao 2002). Porter (2008) opine that the adoption of information technology will change the competitive environment in three ways, namely through changing the structure of the industry, changing the rules of competition, and giving businesses new methods by which to gain competitive advantage over the competition.

Information technology help to communicate between upstream and downstream partners hence creating a virtual supply chain that is information based rather than inventory. Virtual supply chain ensures information is shared among partners thereby forming a process alignment through collaboration that is linked together as a network. Electronic Data Interchange (EDI) and the internet have made it possible for partners in the supply chain to share the same data rather than waiting for that extended chain to transmit data from one step to another. The company that are market driven can easily realize agility by investing in product research and modern information technology that enables it to react quickly to the fluctuations in product demand and sourcing problems.

2.2.4 Supply Chain Integration Theory

Integration is a process of interaction and collaboration in which companies in a supply chain work together in a cooperative manner to achieve mutually acceptable outcomes (Pagell, 2004). Kim and Narasimhan (2002) asserts that supply chain integration links an organization with its customers, suppliers and other channel members by integrating their relationships, activities functions, processes and locations. According to Lambert (2004), successful supply chain management requires cross-functional integration of key business processes within the company and across the network of companies that consist of the supply chain. Organizations must integrate their operations with trading partners in order to sustain competitive advantage for the whole supply chain (Lambert & Cooper, 2000).

Power (2005) asserts that integration involves the cooperation, collaboration, information sharing, trust, partnerships, shared technology and a fundamental shift away from managing individual functional processes to managing integrated chains of processes. Kwon and Suh (2004) consider supply chain integration to be a strategic tool that aims to reduce costs and thus increase customer and shareholder value. Supply chain integration is a good approach for improving business performance in a highly competitive market (Narasimhan, Jayaram, & Carter, 2001). Frohlich and Westbrook (2001) assert that the highest levels of integration with both suppliers and customers have the highest correlation with high levels of an organization's performance.

The major challenge in supply chain integration is to coordinate activities across the supply chain so that the enterprise can improve performance by reducing costs, increasing service levels, reducing the bullwhip effect, better utilization of resources and effectively responding to changes in the market place (Simchi-Levi et al., 2009). Chopra and Meindl (2015) argues that supply chain coordination occurs when all the different stages of supply chain work toward the objective of maximizing total supply chain profitability rather than each stage devoting itself to its own profitability.

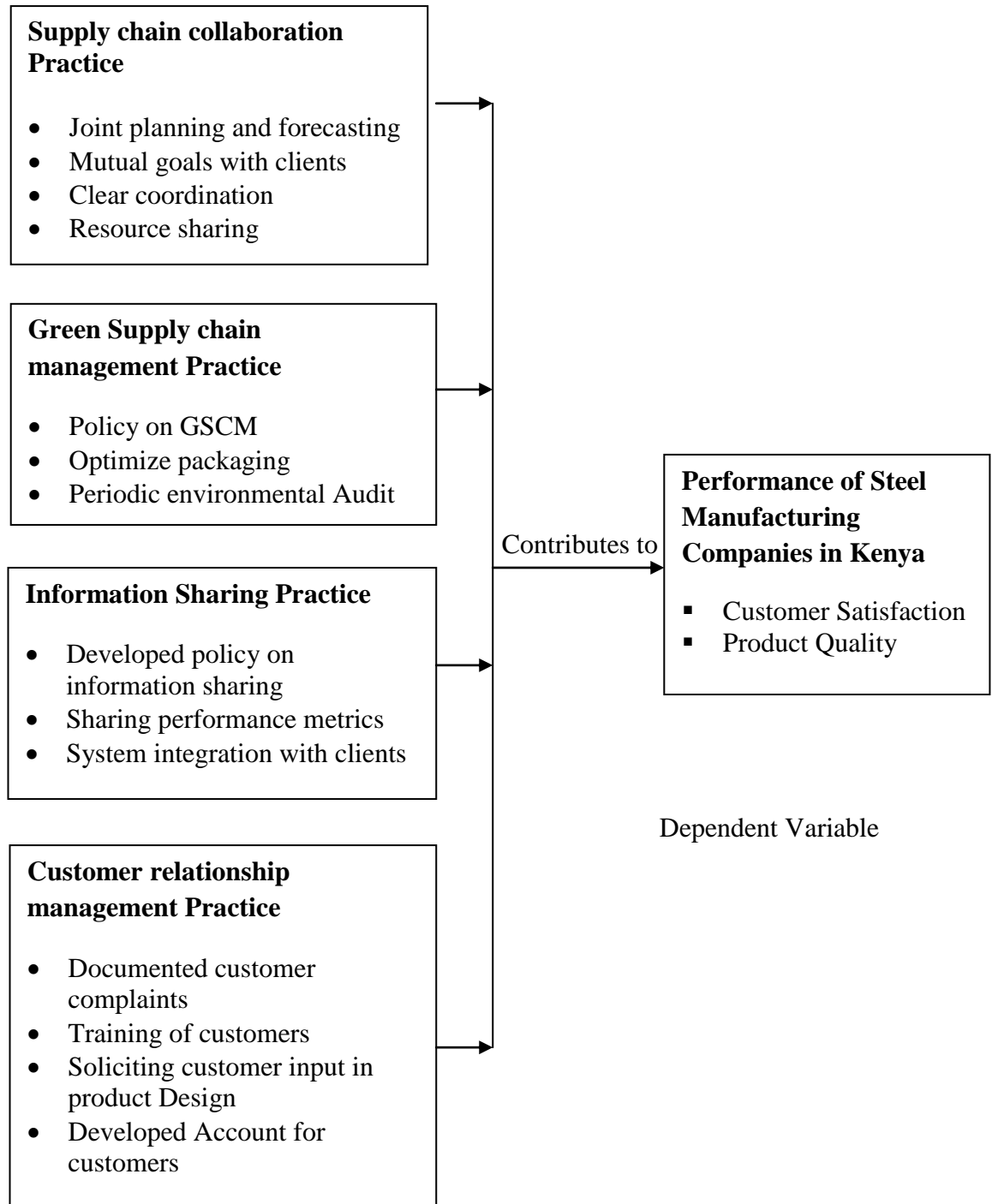
2.3. Conceptual Framework

Conceptual framework is the network of linked concepts that together provides a comprehensive understanding of a phenomenon (Jabareen, 2009). Mugenda, (2008) defines conceptual framework as a concise description of the phenomenon under study accompanied by a graphical or visual depiction of the major variables of the study. Young (2009) asserts that conceptual framework is a diagrammatical representation that demonstrates the relationship between dependent variable and independent variables.

The conceptual framework in this study included independent variables identified as Supply chain collaboration practice, Green Supply chain management Practice, Information sharing practice and Customer relationship management practice on one

hand and the performance of Steel Manufacturing Companies in Kenya as dependent variable on other hand. The problem under investigation was the Contributions of Supply chain management practices on the performance of Steel manufacturing Companies in Kenya. The supply chain management practices that included Supply chain collaboration practice, Green Supply chain management Practice, Information sharing practice and Customer relationship management practice which were independent variables are shown on the left side while the dependent variable which was the Performance of steel Manufacturing Companies in Kenya is shown on the right hand side in the figure 2.1

Supply Chain Management Practices



Independent Variables

Figure 2.1: Conceptual framework

2.4 Empirical Review of Supply Chain Management Practices

Ibrahim and Hamid (2012) employed Integration, information sharing, customer management and speed of responsiveness as supply chain management practices that contributed to performance. Mutuetandu and Iravo (2014) selected customer relations, strategic partnerships, training and information sharing as supply chain management practices that affect organization's performance while Sukati *et al.* (2011) adopted supplier partnership, customer relationship and information sharing as Supply chain management practices that influence performance. In this research, we looked at the contributions of supply chain collaboration practice, Green Supply Chain Management Practice, Information Sharing Practice and Customer relationship management Practice on performance of Steel manufacturing Companies in Kenya.

2.4.1 Supply Chain Collaboration Practice and performance of Steel Manufacturing Companies in Kenya

Collaborative approaches have been shown to deliver a wide range of benefits which enhance competitiveness and performance in terms of better cost management, improved delivery time, improved resource management, improved risk management and delivering incremental business value and innovation (Lysons & Farrington, 2012). Competitive supply chains should be able to integrate supply and demand through collaboration in order to deliver significantly improved performance (Barratt, 2004). Organizations that have incorporated supply chain collaboration among their chain member realizes improved forecast, more accurate and timely information, reduced costs, reduced inventory and improved customer service in their business operations (Simatupang & Sridharan, 2005; Barrat & Oliveira, 2001; Whipple *et al.*, 2007).

Collaborative supply chain initiatives continue to be developed and gain prominence based on the assumption that closer inter-enterprise relationships and enhanced information exchange will improve the quality of decision-making and hence improve supply chain performance (Ahmed & Ullah, 2012). Vertical collaboration enables the suppliers to quickly respond to customer expectations, good product

innovations and anticipate customer needs (Tsai, 2006). Derocher and Kilpatrick (2000) affirmed that a strong relationship increases the likelihood for organization to exchange critical information as required to collaboratively plan and implement new supply chain strategies. Simatupang and Sridharan (2003) argues that effective collaboration requires mutual objectives, integrated policies, appropriate performance measures, a decision domain, information sharing, and incentive alignment. Ryu *et al.*, (2009) asserts that when companies collaborate, they open their information, knowledge and assets to their partners. The sharing of information, decision synchronization and incentive alignment aid the members to maximize their market share, minimize running costs and ensure reliable and timely delivery of products to customers (Sandberg, 2007).

Supply chain collaboration can help in the coordination in supply chain. Chopra and Meindl (2015) argues that supply chain coordination occurs when all the different stages of supply chain work toward the objective of maximizing total supply chain profitability rather than each stage devoting itself to its own profitability. Integration of key business processes in a supply chain is best achieved through collaboration of business partners (Christopher, 2005). Collaborative relationship is multi-dimensional and might involve parties including external partners or alliances, suppliers and customers who work together. Handfield and Nichols (2003) argue that without a foundation of effective supply chain relationships, any effort taken to manage the flow of information or materials in a supply chain is likely to be unsuccessful.

Collaboration can be understood as a form of co-operative inter-organizational relationships, which are socially contrived mechanisms for collective action. Collaboration occurs when firms in the chain set common goals and work jointly to achieve the overall supply chain performance and value to the customer through resources and information exchange between the chain partners. Stank *et al.* (2001), propose that supply chain collaboration is the construct of coordination, participation and joint problem solving between supply chain partners. In order for this sharing of critical information to occur, a high degree of trust must exist among the

collaborating partners (Frankel *et al.*, 2002). Trust has been identified as one of the most recognized social norms for managing and coordinating inter-organizational exchange (Jap, 2001). Kwon and Suh, (2005) opined that it is difficult to imagine a serious business commitment without trust. Success of collaboration has been equated with the ability and readiness of managers to create trust and build relationships among partners (Panayides & Venus Lun, 2009). Collaborative relationships require trust and commitment for long-term cooperation along with a willingness to share risks (Sahay & Maini, 2002).

2.4.2 Green Supply Chain Management Practice and performance of Steel Manufacturing Companies in Kenya

Green supply chain management has emerged as an important organizational philosophy to achieve corporate profit and market share by lowering the environmental risks and impacts while raising the ecological efficiency in the organizations and their partners (Van Hock & Erasmus, 2000). Hsu and Hu (2008), define Green supply Chain Management as an approach to improve performance of the process and products according to the requirements of the environmental regulations. Zhu *et al.* (2013) assert that there is a positive relationship between GSCM practices and firm performance. Srivastava (2007) described GSCM as integrating environment thinking into Supply Chain Management, including product design, material sourcing, manufacturing process, delivery of the final product to the consumers and end-of life management of the product after its useful life.

Zhu *et al.*, (2005) suggested that to stay competitive in the market, the managers should improve their environmental compliance which has been setup by the authority, addressing the environmental concern of the customer and mitigate the environmental impact of their products and services. Developing environmental sound policies and strategies on supply chain helps the organization to address market needs and provide a clear understanding of other supply chain member's priorities. Green supply chain management has numerous benefits to an organization, ranging from cost reduction, to integrating suppliers in a participative decision-making process that promotes environmental innovation (Hall, 2003).

The rise in greenhouse emissions and pollution of the environments by firms has precipitated the need for organizations to realign their supply chain operations with a view of conserving the scarce resources. Environmental issues have been increasingly integrated into international trade and consumers worldwide are increasingly demanding environmentally friendly products (Anbumozhi & Kanda, 2005). Manufacturing companies are differentiating themselves by developing green supply chain networks within their organizations and also with their customers and suppliers. Allen (2010) asserts that greening the supply chain ultimately leads to competitiveness and economic performance. The manufacturing companies have shifted their environmental management approaches from just the end-of-pipe control and treatment of waste to the one that embraces avoidance of environmental harm through entire product life cycle (Handfield *et al.*, 2005). These requires a comprehensive means to reduce pollution through identification and eliminating the sources of pollution at every stage of the product life cycle that include raw material extraction, transportation, manufacturing, product use, recycling, and disposal (Matos & Hall, 2007). They see the application of green manufacturing technologies as the corner stone for their policies for economic growth (Defra, 2008).

Dheeraj and Vishal (2012) discussed green procurement, green manufacturing and materials management, green distribution and marketing and reverse logistics as major components of GSCM practice. The Manufacturing companies have incorporated these green supply chain initiatives to help in eliminating waste along entire value streams. Green procurement is an environmentally-conscious purchasing initiative that tries to ensure that the purchased products or materials meets environmental objectives set by the purchasing firm that involves the reduction, reuse and recycling of materials in the process of purchasing (Salam, 2008). Procurement and supply chain managers are now considering the issues of sustainability in their purchasing of inputs in addition to the traditional purchasing criteria of cost, quality and delivery (Lambert & Cooper, 2000). For them to ensure green manufacturing, companies are now using inputs with relatively low environmental impact that are highly efficient and the one that generate little or no waste in their production processes.

Green manufacturing is associated with clean production method, efficient technology, reduced raw materials costs, reduced environmental and improved corporate image by ensuring low pollution during manufacturing processes (Al-Odeh & Smallwood, 2012). It is designed to minimize the environmental impact in the manufacturing processes of products (Tan *et al.*, 2002). Firms can effectively practice green manufacturing practices through the use of solar energy, recycling of raw materials and utilize biodegradable energy sources in their manufacturing operations (Amemba *et al.*, 2013). While reverse logistics focuses mainly on the role of logistics in product returns, source reduction, recycling, materials substitution, reuse of materials, waste disposal, repair and remanufacturing (Nimawat & Namdev, 2012).

Manufactured products must reach the customers in time and they should be informed about the availability of the product and the capacity of the organization to deliver the right products that meet the environmental concerns of the customer. Green distribution is achievable through green packaging, green transportation and logistics (Nimawat & Namdev, 2012). Ninlawan *et al.* (2010) assert that Green packaging should involve downsized packaging and use of green packaging materials. The design and construction of storage facilities must meet the requirements of non-polluted environment while strengthening maintenance of good humidity, corrosion, waterproofing among other factors (Zhang & Zheng, 2010).

The sustainability of greening process can be achieved when the manufacturing companies share information with their suppliers on the best practice of ensuring environmental compliance during the manufacturing processes through identification and elimination of environmental risks (Barasa, 2014).

2.4.3 Information Sharing Practice and performance of Steel Manufacturing Companies in Kenya

Information sharing has been shown to offer a central enabler of effective supply chain management (Mentzer, 2004; Moberg *et al.*, 2002). Information sharing refers to the access to private data between trading partners thus enabling them to monitor

the progress of products and orders as they pass through various processes in the supply chain (Simatupang & Sridharan, 2002). The sharing of information such as inventory levels, forecasting data and sales trends enables the companies to reduce cycle times, fulfill orders more quickly, cut out millions of dollars in excess inventory and improve forecast accuracy.

Information flow in any supply chain helps to coordinate the physical flows and the interdependencies amongst the organizations in the supply chain (Shah, 2009). The extent of information sharing in a supply chain is expanding and even the possibility of sharing information among competitors has been discussed (Lee & Whang 2000). Sharma and Bhagwat (2006) argue that the flow of information in an organization is the blood life of any business operating unit irrespective of its size.

Supply chain partners can achieve the benefits of sharing of information through the integration of their systems. Information integration refers to sharing of pertinent information among the members that could influence the actions and performance of the other supply chain members in a supply chain (Lee & Whang, 2001). Information provides the visibility needed to make decisions that improve the Company overall supply chain performance (Chopra & Meindl, 2015). Information sharing between the buyer and vendor in the supply chain has been considered as useful strategies to reduce the bullwhip and to improve supply chain performance (Lee *et al.*, 2004).

Quality of information sharing encompasses the accuracy, timeliness, adequacy and the credibility of the information shared (Moberg *et al.*, 2002). There is possibility of information to be distorted as orders are passed along the chain. To reduce information distortion and improve the quality of information shared, information shared has to be as accurate as possible and organizations must ensure that it flows with minimum delay and distortion.

Lau and Lee (2000) asserts that creating an environment for controlled sharing of business data and processes improves information sharing effectiveness among trading partners. Foya (2015) asserts that data sharing has been recognized as very crucial input in day to day activities and operations of organizations in the modern

times because there are various conversations that take place in the organization in the course of product or service delivery, bringing together multiple participants involving the organization, its distributors and clients. However, there is the reluctance on the part of organizations in the supply chain to share information with each other. Information is generally viewed as providing an advantage over competitors and organizations resist sharing with their partners (Vokurka & Lummus, 2000) due to the fear of giving away competitive and sensitive information such as inventory levels, production schedules.

Supply Chain Management relies heavily on information technology to optimize information and products flows among the processes and business partners within the supply chain. Information communication technologies can have a considerable part to play in a competitive strategy. The appropriate use of information systems and information technology can lower the administrative costs of the organization. There are a number of new emerging technologies available to connect the members of a supply chain to support information sharing. These Information Communication technologies have contributed to the evolving of e-business and e-commerce. Information technology such as Enterprise Resource Planning (ERP) systems allow information to be shared seamlessly between members of a supply chain. Information Technologies can also act as a tool to differentiate a product in terms of quality of service and responsiveness to the customer requirements.

2.4.4 Customer Relationship Management Practice and performance of Steel Manufacturing Companies in Kenya

Customer relationship comprises the entire array of practices that are employed for the purpose of managing customer complaints, building long-term relationships with customers and improving customer satisfaction. It is a comprehensive strategy and process of acquiring, retaining and partnering with selective customers to create superior value for the company and the customer through the integration of marketing, sales, customer service and the supply-chain functions of the organization to achieve greater efficiencies and effectiveness in delivering customer value (Parvatiyar & Jagdish, 2001). Buttle, (2009) considered Customer relationship

management (CRM) as the core business strategy that integrates internal processes and functions, and external networks, to create and deliver value to targeted customers at a profit. In order to realize this, the organization must identify customers' requirements and then provide the right combinations of transportation, storage, packaging and information services (Wisner *et al*, 2010).

Predictions of customer behavior help the company to forecast which products customers are likely to purchase and the company can be able to revise pricing policies, offer discounts and design promotions for specific customers. This can be achieved through applications of sophisticated software that sorts customer's information from all sources and uses this information to strengthen the relationship with the customer. These software tools and technologies provide individualize and personalize relationships with customers by providing vital information of the customer from loyalty cards to enhance demand management (Harrison & Van Hoek, 2008). Baran, Galka and Strunk (2008), assert that Customer relationship management is the automation of horizontally integrated business processes involving customer touch point and customer service through telephone, e-mail, web, and direct interaction. Techniques such as collaborative filtering, rule-based expert systems, artificial intelligence and relational databases are increasingly being applied to develop enterprise level solutions for managing information on customer interactions (Parvatiyar & Jagdish, 2001).

The motivating factors for companies moving toward Customer relationship management (CRM) technology are to improve customer satisfaction level, to retain existing customers and to attract new customers by transforming the customer data into knowledge and then uses that knowledge to build relationship (Zavareh, 2008). Customer relationship management systems help the company to identify and reward its most loyal customers for the purpose of retaining and expanding their business. Some of the systems developed to assist in customer relationship management include ERP. Enterprise development planning (ERP) software applications that has been integrated with different modules that deals with customer relationship management, supplier relationship management and e-procurement.

Most companies consider customer relationship management as an important component of Supply chain management practices. Day (2000) asserts that committed relationships are the most sustainable advantage because of their inherent barriers to competition. The growth of mass customization and personalized service is leading to an era in which relationship management with customers is becoming crucial for corporate survival. Good relationships with supply chain members, including customers, are needed for successful implementation of Supply chain management programs. The customer service performance measures are designed to measure flexibility in responding to customer order, information system response and post-sale support. Some companies have established call centers or customer contact centers to ensure they are closer to their clients and be able to attend to their needs. Close customer relationship allows an organization to differentiate its product from competitors, sustain customer loyalty and improve the value given to its customers.

2.5. Performance of Steel Manufacturing Companies in Kenya

Organization performance refers to how well an organization achieves its market oriented goals as well as its financial goals. Performance of the organization can be measured by looking at the quality of product or service, competitiveness of the supply chain, customer satisfaction and profitability. In recent years, organizational performance measurement has received much attention from researchers and practitioners (Gunasekaran *et al.*, 2004). Measuring the performance of supply chain and their member firms is critical for identifying underlying problems and keeping end customers satisfied in today's highly competitive and rapidly changing market place (Wisner *et al.*, 2010). According to Neely (2005) measuring performance is a necessary tool to highlight the extent to which organizational objectives were achieved and to provide information necessary to improve various processes and activities within the organization. Clark (2004) asserts that measuring performance means both quantifying and assessing the level of customer satisfaction and comparing the organization with other organizations starting from different market criteria. Nteere, Namusonge, and Mukulu, (2012) opines that performance measurement is important for organization in ensuring continuous improvement and

also assists in determining whether or not an organization is achieving its objectives. In any organization, the performance measures need to be well integrated across the departments and all firms in the Supply Chain (Barrat, 2004).

Performance measures need to determine the gap between actual and targeted performance and determine organization effectiveness and operational efficiency. Ideal measures of performance will lead to the attainment of double benefits- improvement of supply chain management and effective measurement of the achieved benefits. The performance measure can be grouped in to two; those that concentrate on financial measures such as profit return on investment and productivity. Also there are those measures that put more emphasis on less tangible and non-financial measures in performance measurements. Financial performance measure while important to shareholder, it provide too little information regarding the long-term effectiveness of firm in satisfying customers and hence the many organizations have successfully used product quality and customer service capabilities measures (Wisner *et al.*, 2010). In this study, the metrics for measuring the performance of the steel manufacturing companies was based on non-financial measures that include the product quality and customer satisfaction. Non-financial performance measures positively affect future performance of the organization (Banker, Potter, & Srinivasan, 2000). Non-financial performance measures are also often considered as the process measures that should lead to good financial performance.

2.5.1 Product Quality

The key aspect of quality is essentially the extent to which the company is able to meet stakeholder expectations on certain dimensions that have value for them (Sanner & Wijkman, 2005). Quality is important aspect of customer satisfaction and may be more important than cost in certain industries as high quality levels can lead to increased profits (Fawcett *et al.*, 2007). To sustain and improve competitiveness, companies need to offer high quality products and services than their competitors. Relationship between supply chain quality management practices and organizational performance have been researched and it was found that organizational performance

could be enhanced through improved supply chain quality management (Chu-Hua Kuei *et al.*, 2001).

The quality of something can be determined by comparing a set of inherent characteristics with a set of requirements. If those inherent characteristics meet all requirements, high or excellent quality is achieved. If those characteristics do not meet all requirements, a low or poor level of quality is achieved (Praxiom Research Group Limited, 2010). To ensure quality productions, the management should provide resources to identify problems and implement solutions by working closely with workers and customers.

2.5.2 Customer Satisfaction

Kotler *et al.* (2008), defined satisfaction as a person feeling of pleasure or disappointment resulting from comparing a product perceived performance or outcome in relation to his or her expectation. Customer satisfaction is a state of mind that a customer has about a company when their expectations have been met or exceeded over the lifetime of the product or service. It is an emotional response to the experiences provided by and associated with particular products or services purchased. This emotional response can be triggered by a cognitive evaluative process in which the perceptions of an object, action, or condition are compared to one's values or desires.

Borade and Bansod (2007) assert that customer satisfaction is absolute for staying abreast in competitive environment that can be achieved only by quickly responding to customer needs. Gaining high levels of customer satisfaction is very important to a business because satisfied customers are most likely to be loyal and to make repeat orders and to use a wide range of services offered by a business. It can also help any company identify opportunities for product and service innovation and also serve as a basis for performance appraisal and reward systems. Kotler *et al.* (2008) pointed out that it is important to measure customer's satisfaction regularly through survey to determine customer's level of satisfaction. Customer satisfaction surveys help Companies to get feedback from their clients.

Customer satisfaction information assists the company an insight into exactly how people respond their product or services. It provide information on where to invest to maximize customer loyalty, how to turn everyday customers into delighted customers, and even help the company to recover unsatisfied customers before they write off your brand forever. Customers should be given opportunities to provide feedback about a product, service or organization through customer feedback cards placed at strategic place.

2.6. Critique of the Existing Literature

There is no a universal definition of supply chain management and is as a result of the way the concept of supply chain has been developed. The concept of supply chain has been considered from different points of view in different bodies of literature. Supply chain management as a discipline uses overlapping terminologies that is drawn from multiple-disciplinary bases (Croom & Romano, 2000). Shapiro (2001) showed that the SCM combines concepts from disciplines such as strategic management and theory of the formation of the company, logistics, production and inventory management, accounting management, scientific forecasting, marketing, and operations research.

There are no specific elements that are conventionally accepted as best supply chain management practices. Ibrahim and Hamid (2012) assert that many authors studied supply chain management practice have used various elements and dimensions to measure the supply chain practice. Chin *et al.* (2010) considered information sharing, customer relationship, strategic supplier partnership, material flow management and corporate culture as the supply chain management elements in his study of a structural model of supply chain management on firm performance while Tan, Lyman and Wisner (2002) identified six elements of supply chain management practice as supply chain integration, information sharing, supply chain characteristics, customer service management, geographical proximity and JIT capability. There is also little consensus regarding how supply chain management actually should be implemented and measured (Mentzer, 2004). Lockamy and

McCormack (2004), argue that supply chain management is more difficult to operationalize in practice than some academics or consultants seem to claim.

The absence of a comprehensive Supply chain management definition makes it more difficult for supply chain executives to claim authority and responsibility for the right combination of functions and processes. It also makes it more difficult to benchmark against other companies and industries on supply chain metrics, job responsibilities and other human resource issues because of the differences that exist from one company to the next (Näslund & Williamson, 2010). Storey *et al.* (2006) argues that if supply chain management has to mature as a discipline there need to further the progress in clarifying its domain, its central problems, its core components, its theories and its theoretical map.

2.7. Research Gaps

Sukati *et al.* (2011) investigated the relationship between supply chain management practices and the competitive advantage of firm. Supply chain management practices that he adopted included supplier partnership, customer relationship and information sharing. The study was conducted in Malaysia manufacturing industry by sending questionnaires to 200 supply chain practitioners. The study showed that there is a positive relationship between supply chain management practices and the competitive advantage of the firm.

Li *et al.* (2006) investigated the impact of supply chain management practices on competitive advantage and organizational performance. Supply chain management practices identified were strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing and postponement. The results showed that the organizations with high level of Supply chain management practice can lead to enhanced competitive advantage and improved organizational performance. The study was carried out in USA and metrics for measuring organizational performance using both financial and market criteria, included return on investment (ROI), market share, profit margin on sales, the growth of ROI, the growth of sales, the growth of market share, and overall competitive position.

Sari (2009) investigated the Framework for analyzing and developing information integration. A study on steel industry maintenance service supply chain. The aim of his study was to understand the meaning, constituents, extent, and development means of information integration in service supply chain context. He argued that service providers should be integrated to the supply chain just like other supply chain members as it contributes to the supply chain performance. Gustav and Mankowitz (2008) aimed at investigating Supply Chain Management in the Swedish steel industry. It specifically investigated how actors in the industry regard their supply chains in relation to their overall strategy and what implications industry specifics have when the flow of material and information is to be optimized.

Ibrahim and Hamid (2012) carried out a study on supply chain management practices and supply chain performance effectiveness in manufacturing companies in Sudan. They collected through questionnaires by sending to supply chain managers or top-level executives in 150 large manufacturing corporations among Sudanese listed in and registered in ministry of industry. They found that Integration, information sharing, customer management and speed of responsiveness were the supply chain management practices that were adopted in the study. The study revealed that there is a positive relationship between supply chain management practices and performance through effectiveness. A study by Toyin (2012) carried out in Nigerian manufacturing companies on the impact supply chain management practices on the performance revealed that information sharing, information quality, lean system and postponement has positive effect on Supply chain management performance of Nigerian manufacturing companies.

Musuya and Namusonge (2013) assessed the factors that affect the implementation of JIT supply chain practices in public health sector in Kenya and found that product demand/ supply stability variable influence on the ability to implement JIT in Ministry of public health. Mutuetandu and Iravo (2014) investigated the impact of Supply Chain Management Practices on Organizational Performance: A Case Study of Haco Industries Limited (Kenya).The study found out that supply chain management practices like customer relations, strategic partnerships, training and

information sharing have a positive effect on the organization's performance. Kimani (2013) investigated the supply chain management challenges in Kenya petroleum industry: Case of national oil corporation of Kenya and found out that four independent variables namely; information technology, supply chain design, collaboration issues and people issues are very critical to effective supply chain management in the petroleum sector.

Okello and Were (2014) conducted the study on the Influence of supply chain management practices on performance of the Nairobi securities exchange's listed, food manufacturing companies in Nairobi. The study identified product development processes, inventory management, lead time, technology and innovation as supply chain management practices in the study. They asserted that five Supply chain management practices have a significant influence on the performance of food manufacturing companies in Kenya. They suggested that supply chain interventions need to be put in place to address issues such as negotiating contracts with external suppliers, involvement of E-procurement, creation of a close relationship with suppliers and provision of continuous tracking over the physical movement of inventor.

Okemba and Namusonge (2014) conducted research to establish whether reverse logistics as green supply chain management practices determines supply chain performance in Kenya's manufacturing firm: A case study of Nairobi based firms in the food and beverage sector. Findings revealed that the firms in focus had adopted GSCM practices to a great extent, was however there was a disconnect between adoption and practice in that, respondents affirmed that they had incorporated recyclable content as well as ensured reusability of their packaging but when it comes to collecting the same used packages under reverse logistics, a significant percentage (46%) was non-committal on whether they collect from customers/return to their suppliers.

Osoro *et al.* (2015) analyzed the effect of crude oil price as a determinant on performance of supply chain systems in the petroleum industries in Kenya. The study employed a censuring sampling frame due to the fact that the targeted populations of

entire stakeholders was about 73 companies who are involved daily in the oil industry management. It was established that cost of crude oil affects performance of supply chain systems in the petroleum industries. Namasenge and Biraori (2015) conducted study that aimed at assessing the effect of supplier relationship on the effectiveness of supply chain management practices in Kenyan public sector: case of Ministry of Finance. The study identified that lack of supplier relationship management strategies lowered the effectiveness of supply chain management functions. Okanda, Namusonge and Waiganjo (2016) investigated the influence of supply planning practice on the performance of the unit of vaccines and immunizations in the Ministry of health, Kenya and found out that supply planning practices such as optimum inventory procurement, determination of health requirements of health facilities at every node, aggregate determination requirements and joint coordination with suppliers if adopted by the unit of vaccines and immunizations will increase the performance positively

Although the studies carried out by Mutuetandu and Iravo (2014) addressed some variables in this study, this study was not carried out in steel manufacturing companies in Kenya. The studies carried out in steel industry, were either done in developed countries like Sweden (Gustav & Mankowitz, 2008) and Finland (Sari, 2009). Most of studies done in Kenya did not address specifically the steel manufacturing companies and the variables used as supply chain management practices were different from the one used in this study. Hence there was need for an empirical study to be carried out in steel industry in Kenya. The study adopted the supply chain management practices that included supply chain collaboration practice, Green Supply Chain Management Practice, Information Sharing Practice and Customer relationship management Practice.

2.8. Summary

Literature review looked at a number of areas that were deemed to be relevant to the study objectives. The following theories relevant to the study were reviewed and this included Supply chain management theory, the lean supply chain theory, the agile supply chain theory and supply chain integration theory. Conceptual framework was

developed with the elements of supply chain collaboration practice, information sharing practice, customer relationship management practice and green supply chain practice as independent variables and performance of steel manufacturing companies in Kenya as dependent variable. These discussions helped in shedding some light on the supply chain management practices since Supply chain management is a multi-dimensional concept and there is no single theory or theories that could adequately explain the concept.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research design, the target population, Sampling techniques and sample size. It also discusses the research instruments that was adopted in the study, data collection procedures, pilot study, validity and reliability and not limited to Data analysis and processing and variable definition and measurement. The research adopted objective philosophical approach where the research methodology choice was made objectively.

3.2 Research Design

Descriptive survey design was adopted in conducting this study. Creswell (2013) asserts that a descriptive research design is used when data are collected to describe persons, organizations, settings or phenomena. The design also has enough provision for protection of bias and maximized reliability (Kothari, 2012). It was appropriate for this study because it allowed the collection of information for independent and dependent variables using interview and questionnaires (Orodho, 2009). The descriptive approach was appropriate for this study not only in validating finding but also in the formulation of knowledge and providing solutions to the problems. The researcher used this approach since it involves data collection, measurement, classification, analysis, comparison and interpretation to provide report summary such as measures of central tendency and correlation between variables.

The research design also enabled the study to combine both quantitative and qualitative research approaches in assessing the contributions of Supply Chain Management practices on the performance of Steel Manufacturing Companies in Kenya. The mixed research design that consist both qualitative and quantitative approaches allows researcher to collect information from the people on their habits, opinions, attitudes and any other educational or social issues (Namusonge, 2010). The researcher more specifically used a quantitative research design. Quantitative

approach is a design that sets out to quantify data in order to use statistics to analyze a data set (Zikmund & Babin, 2007). Quantitative approach strives for precision by focusing on items that can be counted into predetermined categories and subjected to statistical analysis (Simiyu, 2012). Mugenda and Mugenda, (2008) asserts that qualitative methods can be used to gain more in depth information that may be difficult to convey quantitatively. The quantitative data were obtained by administering the questionnaire to members of procurement department, Information Technology department, marketing department and production department.

3.3 Target Population

Population is defined as the entire group of people or things of interest that the researcher wishes to investigate (Sekaran & Bougie, 2010).The population of this study was all registered steel manufacturing companies in the republic of Kenya. Kenya has 258 registered steel products manufacturers (Africainvestor, 2011).The target population of this study were all employees working in the 32 Steel manufacturing companies in Kenya (As shown in Appendix VII).

Table 3.1: Target Population

| Level of Annual Turnover | Number of Steel Manufacturing Companies |
|---------------------------------|--|
| Less than 1.0 Billion | 150 |
| 1.0 Billion to 5.0 Billion | 83 |
| 5.0 Billion to 10.0 Billions | 15 |
| Above 10.0 Billions | 10 |
| Total | 258 |

3.4 Sampling Frame

The sampling frame describes the list of all population units from which the sample was selected (Cooper & Schindler, 2008). A sampling frame of this study included all the registered Steel Manufacturing Companies in Kenya in the year 2006 (Kenya Association of Manufacturers, 2006).The Individual Company's sampling frame

were provided by Human resource manager of each steel manufacturing company by the help of research permit. Sampling frame enabled the researcher to select required number of key respondents randomly and ensured that all members of the population of interest had an equal chance of being selected in the sample. Saunders and Lewis (2009) argue that key informants are contact persons who help field researcher gain information about the research setting.

3.5 Sample and Sampling Technique

The researcher used purposive sampling technique, specifically judgmental sampling method to identify and select eligible Steel manufacturing companies and the departments to be included in the study. According to Sekaran and Bougie (2010), judgmental sampling involves the choice of subjects who are most advantageously placed or in the best position to provide information required. Purposive sampling allows the researcher to use cases that have the required information with respect to the objectives of his or her study (Mugenda & Mugenda, 2008). Out of 258 registered steel manufacturing companies in Kenya, the researcher purposively sampled 32 companies for the study based on the theoretical assumption that the distribution is assumed to be normally distributed with a sample size of a above 30 objects The sample size was determined using Cochran (1977) sampling frame for large population number.
$$\text{Sample Size} = \frac{z^2 pq}{e^2} = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2} = 384$$
 where $z = 1.96$, $p = 0.5$, $q = 0.5$ and $e = 0.05$.

The sample size to participate in this research was to be 384 respondents and each company was to contribute 12 respondents in the study as shown in the table 3.1. The sample size selected depends on what researcher wants to know, the purpose of the study, what is at stake, and what can be done with available time and resources (Paton, 2002). Stratified sampling was used to select participants from each of the company. The sample size of 384 is more than the generally recommended sample size of 100 cases for statistical data analysis (Alreck *et al.*, 2004).

Table 3.2: Sample Size

| Level of Annual Turnover | Population | Sample Size |
|---------------------------------|-------------------|--------------------|
| Less than 1.0 Billion | 150 | 15 |
| 1.0 Billion to 5.0 Billion | 83 | 10 |
| 5.0 Billion to 10.0 Billions | 15 | 5 |
| Above 10.0 Billions | 10 | 3 |
| Total | 258 | 32 |

3.6 Data Collection Methods

This study used the questionnaires in collecting the primary data while secondary data were obtained from journals, textbooks, Internet and Kenya association of Manufacturer magazines. Face to face in-depth interview was conducted to collect information from the Procurement Managers that helped to get a complete and detailed understanding of the contributions of supply chain management practices on the performance of Steel manufacturing companies in Kenya. Mugenda and Mugenda (2008) assert that questionnaire is designed to address specific objective, research question or test hypothesis. This study used questionnaire because of its ability to collect large amount of information in a reasonably quick space of time and also is made the analysis is data simpler based on the research objective of the study. In addition, all questions were standardized and anonymity of the respondent was quarantined for the purpose of increasing the response rate. This mix of sources allowed for additional cross-checking of the findings for the purpose of evaluating the internal consistency and to increase reliability.

3.7 Data Collection Procedure

The researcher obtained necessary authorization and clearance from relevant authority before commencing the study. The researcher obtained authorization letter from NACOSTI and an introduction letter from the University. A cover letter was attached to each questionnaire to assure the participants that the information given will be anonymous and confidential. The research study made use of three research assistants who were recruited on the basis of their familiarity with the study area and

had previous data collection experience. The researcher further trained the research assistants and properly briefed them of what was expected of them. The research assistants also participated in the pilot testing of the questionnaire as part of practical training.

Data collection included completion of the questionnaires by respondents and interviews with the top management of Steel Manufacturing Companies in Kenya. The instruments were administered by the researcher and three research assistants. Data were collected from 20th November 2014 to 15th December 2014. Before administering the questionnaire, researcher and research assistants visited the respondents, explained the purpose of research and data collection procedures and made appointment for data collection. On the day of appointment, the researcher or research assistants personally delivered the questionnaire and waited as the respondent completed it, giving an opportunity to provide additional information to the respondent when required.

After completion, the researcher and research assistants collected the questionnaire. High level of accuracy was achieved by field and central editing (Kothari, 2003). In field editing, the researcher or research assistants reviewed the completed questionnaires at the point of data collection. At the end of each day, the collected questionnaires were re-examined before being filed. Any unclear and incomplete responses were sorted out with the respondent immediately.

Regarding the interview, the researcher visited the Procurement Managers. After introduction and explanation of the purpose of the study, an interview appointment was made. On the day of appointment, the researcher conducted a face to face interview. The researcher asked questions and gave the Procurement Managers sufficient time to respond. The researcher wrote down the responses. At the end of the interview, the researcher read the responses to the Procurement managers. Any unclear responses were clarified as others were deleted or added.

After collecting data from the respondents through the questionnaire, data was then edited to check for completeness, consistency and reliability of data. The next step involved coding the responses in the coding sheets by transcribing the data from questionnaire by assigning characters the numerical symbols. This was followed by screening and cleaning of data to make sure there no errors. After these data was transferred to SPSS for analysis.

3.8 Pilot Study

A pilot survey was carried out using the developed questionnaires to test and improve the flow and clarity of the questionnaires before the actual collection of data. (Wisner, 2007), asserts that a pilot study helps in refining the questions by removing some irrelevant items and adding others to genuinely engage with the participants. A pilot study is a mini-version of a full-scale study or a trial run done in preparation of the complete study. In this study, piloting was done and the instruments were checked to find out if they yield similar results after pre-testing. The reliability of items was based on the estimates of the variability of participants responding to the items. The instruments was administered to the same subjects after a period of two weeks then tested for the reliability. The questionnaire was pre-tested before the survey to determine the best possible way of administering and restructure questionnaire to enhance consistency of responses.

3.8.1 Validity of Research Instrument

Validity is the criteria for how effective the design is in employing methods of measurement that captures the data for the purpose of addressing the research questions. To ensure the results of the study reflect similar outcomes elsewhere and be generalized to other populations or situations, the researcher used triangulation to enhance the external validity of the research instrument. Triangulation refers to the attempt to get a true fix on a situation by combining different ways of looking at the findings. Triangulation validates the methodology by an examination of the results from several perspectives. This research used questionnaire as primary data and research journals, textbooks and other public documents as secondary data. By

combining data sources and methods triangulation opens the way for more credible interpretations (Decrop, 2004).

To achieve construct validity, questions were organized around the specific objectives of the study namely: Supply chain Collaboration practice, Green Supply chain practice, Information Sharing practice and Customer relationship management. Content and criterion related validity was achieved by consultations with supervisors, fellow students pursuing the degree of doctor of philosophy in business administration and experts in instrument development. Views and comments from these stakeholders were used to upgrade the instrument. The use of supervisors and experts opinion enhanced content and criterion related validity. To ensure Pilot testing of the research instruments assured that the instrument used was clear and unambiguous and enabled the researcher to make modifications to an instrument based on results obtained from the pilot study. This helped in realizing internal validity.

3.8.2 Reliability of Research Instrument

The reliability of an instrument refers to its ability to produce consistent and stable measurements. It estimates how accurately the data obtained in the study represents a given variable or construct in the study (Mugenda & Mugenda, 2008). The goal of reliability is to minimize the errors and biases in a study (Yin, 2013). To ensure the reliability a pilot survey was carried to test and improve the flow and clarity of the questionnaires before the actual data collection. . (Wisner, 2007), asserts that a pilot study helps in refining the questions by removing some irrelevant items and adding others to genuinely engage with the participants. The research instruments were checked to find out if they yield similar results after pre-testing. The reliability of items was based on the estimates of the variability of participants responding to the items. The instruments were administered to the same subjects after a period of two weeks then tested for the reliability.

The researcher also used Cronbach's Alpha to test the reliability of the proposed constructs. Known for its stability and flexibility, Cronbach's alpha is a function of internal consistency or interrelatedness of items (Tavakol & Dennick, 2011). The alpha can take any value from zero (no internal consistency) to one (complete internal consistency). Supply Chain Collaborative Practice (SCC) had alpha of 0.914, Green Supply Chain Management practice (GSCM) had 0.951, Information Sharing Practice (IS) had 0.976, Customer Relationship Management Practice (CRM) had 0.962, performance in terms of customer satisfaction had 0.982 and performance in terms of product quality had 0.980. This shows that there is strong internal consistency among measures of variable items.

3.9 Data Analysis and Presentation

The researcher examined all the questionnaires for completeness and consistency and then categorized all the items before coding. The collected data was analyzed using SPSS version 20 (Statistical Package for Social Science) as the researcher obtained data using a standard questionnaire. Quantitative technique was used to code qualitative data. Trochim (2004) asserts that qualitative data can be coded quantitatively without detracting from the qualitative information.

Descriptive statistics was used to examine the characteristics of the population. It enabled the researcher to meaningfully describe a distribution of scores using statistics that is depends on the type of variables in the study and the scale of measurement. Mugenda and Mugenda (2008) assert that descriptive statistics enable the researcher to describe distribution of scores. Variable aggregation for different variables was undertaken in facilitation of further statistical analysis. The researcher applied "Collapsing Response" method in analyzing responses from a Likert scale measurement. This is done by adding the 'strongly agree' responses with the 'agree' responses and also adding the 'disagree' responses with 'strongly disagree' (Gwavuya, 2011).

3.9.1 Correlation Results

Correlation is the degree of relationship existing between economic variables. Both correlation and regression analysis can be used to examine the presence of a linear relationship between two variables. The correlation analysis was carried out between the variables of the study using Pearson correlation coefficient. This was to test whether there existed interdependency between independent variables and also to examine if there exist significant relationship between the independent variables Supply chain collaboration practice, Green supply chain management practice, Information sharing practice and Customer Relationship management practice and the dependent variable that is performance of Steel manufacturing companies in Kenya.

Mugenda and Mugenda (2008) assert that correlation technique is used to analyze the degree of relationship between two variables. They measure the strength and direction of a relationship between variables. The correlation coefficient values ranges from negative (-1) to positive (+1). When the value is zero, it means there is no relationship between two variables. The direction of the relationship is also important such that when the correlation coefficient (r) is positive (+) it means that when one variable increases, the other variable increases or when one variable decreases the other variable also decreases also when correlation coefficient (r) is negative (-), it means that when one variable decreases, the other variable increase and vice versa. The correlations have different strengths, when $0.10 \leq r \leq 0.29$, it means there is weak relationship, when $0.30 \leq r \leq 0.49$, there is moderate relationship and when $0.50 \leq r \leq$ above , the relationship is strong.

3.9.2 Test of Hypothesis (ANOVA)

The null hypothesis was tested by use of F- ratio using a two way Fisher's Analysis of Variance [ANOVA] on assumption of the homogeneity of the variance of the sample that is normally distributed at 95% confidence interval. The level of significance is the statistical standard that is specified for the purpose rejecting the null hypothesis (Namusonge, 2010). Mugenda and Mugenda (2008) argue that the

analysis of variance is used because it makes use of the F – test in terms of sums of squares residual.

According Sawilowsky (2002), F test is useful in ANOVA to assess whether the expected values of a quantitative variable within several pre-defined groups differ from each other. The F statistic tends to be greater when the null hypothesis of independence is not true. The P value is crucial in ascertaining the probability that the null hypothesis is true. p values of less than 0.005 indicates that the F statistic is high and that the null hypothesis of independence needs to be rejected since it is not true (Sawilowsky,2002). This helped in determining the relationship between supply chain management practices and the performance of Steel manufacturing companies in Kenya.

3.9.3 Multiple regression Results

Multiple regression analysis is used when one is interested in predicting a continuous dependent variable from a number of independent variables. It shows the percentage of the total variation of the dependent variable that can be explained by the independent variables and this is assessed using the coefficient of determination (R^2) which is used for judging the explanatory power of the linear regression of dependent variable on independent variables. R^2 is a measure of the goodness of fit of the regression line to the observed sample values of dependent and independent variables. The R^2 can range from 0.0 to 1.0, with 1.0 showing a perfect fit that indicates that each point is on the line (Carver *et al.*, 2009).

Multiple regression analysis was appropriate in this study because the researcher had one single dependent variable that is the performance of steel manufacturing companies in Kenya which is presumed to be the function of several independent variables of supply chain management practices that included; Supply chain Collaboration practice X_1 ; Green Supply chain Management practice X_2 ; Information Sharing practice X_3 and finally Customer Relationship Management practice X_4 .

Multiple regression attempts to determine whether a group of independent variables together predict a given dependent variable (Mugenda and Mugenda, 2008). In this study the multiple regression model was as follows;

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon \quad (\text{Ott \& Longnecker, 2010})$$

Where;

Y = Represents the dependent variable; Performance of Steel Manufacturing Company

β_0 = Constant (Slope) of the Model

$\beta_1, \beta_2, \beta_3$ and β_4 are the regression coefficients

ϵ = Random Error of the Model

X_1 = Supply chain Collaboration practice

X_2 = Green Supply chain Management practice

X_3 = Information Sharing practice

X_4 = Customer Relationship Management practice

3.9.4 Test of Multicollinearity of Independent Variables

It's good to have a relationship between dependent and independent variables, but it's bad to have a relationship between independent variables. Multicollinearity occurs when more than two independent variables inter-correlate. When there is multicollinearity among independent variables, the analysis cannot distinguish the effects of one variable over the other (Norusis, 2009). Though multicollinearity has no impact on the overall regression model and associated statistics such as R^2 , F-ratios and p-values, for the purpose of detecting multicollinearity among independent variables, the researcher computed correlations between independent variables. A

common rule of thumb is that correlations among the independent variables should be less than 0.70 to remove the difficulties in regression analysis (Lind *et al.*, 2011).

3.10 Measurement of Variables

3.10.1 Performance of Steel Manufacturing Company

This is the dependent variable and was measured using two dimensions namely customer satisfaction and Product quality. Non-financial performance measures positively affect future performance of the organization (Banker, Potter, & Srinivasan, 2000). Non-financial performance measures are also often considered as the process measures that should lead to good financial performance. The three items were aggregated to capture the performance of Steel manufacturing companies in Kenya that included customer retention rate of my company has gone up; Customer acquisition rate of my company has improved and there has been increased number of referral for my company's products using customer satisfaction as a measure while three other. Also three items were aggregated to capture the performance of steel manufacturing companies in Kenya using Product quality as a measure. These items were; Number of failures or reject rates has reduced in my company; Number of product returned by our clients has reduced and Number of customer complaints has gone down in our company. The researcher used a five point Likert scale (5 =strongly Agree, 4= Agree, 3= Neutral, 2= Disagree and 1=strongly disagree).

3.10.2 Supply chain collaborative practice

This is the independent variable that was used in assessing all the process that focuses on the interaction between the company and suppliers that are in upstream in the supply chain. Six items were aggregated to capture the contributions of Supply chain collaboration management practice on the performance of steel manufacturing companies in Kenya. The items included; My Company involves our suppliers in the joint planning and forecasting process; my company relationship with its suppliers is based on mutual understanding and mutual goals; my Company has a clear policy on managing the relationship with suppliers; my Company has developed the system to

monitor the supplier performance; There is clear coordination and resource sharing between my company and our supplier and lastly there is standardized means of communication across all functions in my company and our suppliers. The researcher used a five point Likert scale (5 =strongly Agree, 4= Agree, 3= Neutral, 2= Disagree and 1=strongly disagree).

3.10.3 Green Supply Chain Management Practice

This is the independent variable that was used in assessing the company's level of implementation of green supply chain practices with its suppliers to improve products or manufacturing processes. Three items were aggregated to capture the contributions of Green Supply chain management practice on the performance of steel manufacturing companies in Kenya. The items included; My Company has developed policy on green supply chain management practices to guide suppliers and the company on GSCM; My Company optimize the packaging processes to reduce cost and My Company conducts periodically environmental Audit. The researcher used a five point Likert scale (5 =strongly Agree, 4= Agree, 3= Neutral, 2= Disagree and 1=strongly disagree).

3.10.4 Sharing Practice Information

This is the independent variable that was used in assessing all the processes that facilitate the communication of critical information in the company to its supply chain partner. Six items were aggregated to capture the contributions of Information sharing practice on the performance of steel manufacturing companies in Kenya. These items were; My Company has developed the policy to guide on the information sharing within and outside our organization; My company has fully invested in state of art information system to enable information sharing within and outside our company; Production and delivery schedules of our company are shared across our supply chain; Performance metrics of our company are shared across our company's supply chain; Order fulfillment and shipment status of our company are tracked at each step across the supply chain and lastly Our company information systems are integrated with our key clients. Five point Likert scale (5 =strongly

Agree, 4= Agree, 3= Neutral, 2= Disagree and 1=strongly disagree) was used by the researcher.

3.10.5 Customer Relationship Management Practice

It involves all processes that are employed by the organization for the purpose of managing customer complaints, establishing long term relationship with customers and improving customer satisfaction. It is an independent variable. Six items were aggregated to capture the contributions of Information sharing practice on the performance of steel manufacturing companies in Kenya. These items were; My company has documented procedures to deal with customer complaints; My company offer after sales service to their clients; My company solicits customers' inputs in our products design; My company conduct training to our customers; My company has developed accounts for our key customers and finally Customer satisfaction criterion is used to evaluate the performance of our company. Five point Likert scale (5 =strongly Agree, 4= Agree, 3= Neutral, 2= Disagree and 1=strongly disagree) was used by the researcher.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents empirical findings and results of the application of the variables using techniques mentioned in chapter three. It starts with the response rate, Reliability analysis, Demographic data, Descriptive analysis, correlation analysis, regression analysis and finally discussion of research findings.

4.2. Response Rate

A total of 384 respondents were sampled in the study. Two hundred and forty four (244) respondents filled and returned the questionnaire. The response rate was 64% of the total respondents. Fifteen procurement managers were interviewed and this was 56% of the total 36 respondents. Campion (1993) suggested that authors need to make reasonable efforts to increase questionnaire return rates, address the influence of non-respondents and ensure that they don't contain any obvious biases.

To achieve the observed return rate for this study the researcher met the respondents in their work stations and briefly explained to them the purpose of the study, informed them of their rights of voluntary participation while assuring them of their confidentiality before administering the questionnaire. The respondents were then given a week to complete the questionnaires which were then collected after one week. Some scholars have suggested a minimal level for return rate.

Mugenda and Mugenda (2008) observed that a 50% response rate is adequate, 60% good and above 70% is rated Very Good. Dillman (2000) suggested 50% as the minimal level while Fowler (2009) suggests 60%. Babbie (2011) also asserted that return rates of 50% are acceptable to analyze and publish, 60% is good and 70% is very good. Thus, the 64% return rate for this study was considered credible enough to allow generalization of the findings to the target population

4.3 Reliability Results

The reliability of an instrument refers to its ability to produce consistent and stable measurements. The alpha can take any value from zero (no internal consistency) to one (complete internal consistency). George and Mallery (2011) provided the following rules of thumb for Cronbach's Alpha values: “ $\alpha > .9$ – Excellent, $\alpha > .8$ – Good, $\alpha > .7$ – Acceptable, $\alpha > .6$ – Questionable, $\alpha > .5$ – Poor, and $< .5$ – Unacceptable”.

Table 4.1: Summary of Cronbach's alpha Reliability Coefficient

| Variables | Number of Items | Cronbach's Alpha |
|---|-----------------|------------------|
| SCC Practice X ₁ | 6 | 0.914 |
| GSCM Practice X ₂ | 3 | 0.951 |
| IS Practice X ₃ | 6 | 0.976 |
| CRM Practice X ₄ | 6 | 0.962 |
| Performance in terms of Customer Satisfaction | 3 | 0.982 |
| Performance in terms of Product Quality | 3 | 0.980 |

In this study to ensure the reliability of the instrument Cronbach's Alpha was used to test the reliability of the proposed constructs. As shown in table 4.1, Supply Chain Collaborative Practice (SCC) had alpha of 0.914, Green Supply Chain Management practice (GSCM) had 0.951, Information Sharing Practice (IS) had 0.976, Customer Relationship Management Practice (CRM) had 0.962, performance in terms of customer satisfaction had 0.982 and performance in terms of product quality had 0.980. This shows that there is strong internal consistency among measures of variable items.

4.4 Demographic Data

4.4.1 Age

Table 4.2 shows that majority 42.2% of respondents were of the age of 41-50 years, 40.2% were of the age of 31-40 years, 13.5% were the age of 20-30years, 3.3% were of the age of 51-60 and 0.8% was aged 61-70 years

The age of respondents was necessary since most dimensions of physical performance decline constantly with age for virtually all types of measures, at least beyond the age of 30 to 35 years (Stones and Kozma, 1985).

Table 4.2: Respondent's Age

| Respondent's Age | Frequency | Percent (%) |
|-------------------------|------------------|--------------------|
| 20-30 Years | 33 | 13.5 |
| 31-40 Years | 98 | 40.2 |
| 41-50 Years | 103 | 42.2 |
| 51--60 Years | 8 | 3.3 |
| 61--70 Years | 2 | .8 |
| Total | 244 | 100.0 |

4.4.2 Respondents' Gender

A gender diverse team produces high quality decisions over a homogeneous team. A positive relationship of gender diversity with performance would be anticipated based on a resource-based view of the firm whereas social identity and self-categorization theory would support a negative relationship (Mohammad *et al*, 2007). Gupta (2013) observed that moderate level of gender diversity increases competitive advantage while a higher level of gender diversity decreases organizational performance.

In this study out of the 244 respondents 68% (166) were male and 32% (78) were female from the sampled Steel manufacturing Companies in Kenya as shown in table 4.3. This indicates that generally there were more male respondents for the study

than females indicating the wide disparity between male and females working in steel manufacturing Companies in Kenya.

Table 4.3: Respondents' Gender

| Gender | Frequency | Percent (%) |
|---------------|------------------|--------------------|
| Female | 78 | 32.0 |
| Male | 166 | 68.0 |
| Total | 244 | 100.0 |

This result is consistent with previous research by Ellis, Cutura, Dione, Gillson, Manuel and Thongori (2007) which established that in spite of women being major actors in informal sector in Kenya's economy while men dominate in the formal sector citing the ratio of men to women in formal sector as 74%:26%.

4.4.3. Respondent's Designation

Table 4.4 shows a descriptive analysis by designation that reveals majority (9.8%) of respondents were Supply chain officer and the least (6.9%) were Production Engineers. 7.3% Environmental Health officers and Information Technology (IT) managers each were represented , Marketing Managers, Procurement managers, Production managers, Quality assurance officers, sales executives, and web site administrators were at 8.6% each. Only 7.8% of Stock controllers and Store supervisors represented the total number of respondents who participated in the research.

Table 4.4: Respondent's Designation

| Designation | Frequency | Percent (%) |
|------------------------------|------------------|--------------------|
| Environmental Health Officer | 18 | 7.3 |
| IT Manager | 21 | 8.6 |
| Marketing Manager | 21 | 8.6 |
| Procurement Manager | 21 | 8.6 |
| Production Engineer | 17 | 6.9 |
| Production Manager | 21 | 8.6 |
| Quality Assurance Officer | 21 | 8.6 |
| Sales Executive | 21 | 8.6 |
| Stock Controller | 19 | 7.8 |
| Store Supervisor | 19 | 7.8 |
| Supply Chain Officer | 24 | 9.8 |
| Web Site Administrator | 21 | 8.6 |
| Total | 245 | 100.0 |

4.4.5 Company's Annual Turnover

Table 4.5: The company's annual turnover

| Annual Turnover | Frequency | Percent | Cumulative Percent |
|------------------------|------------------|----------------|---------------------------|
| Less than 1.0 Billion | 59 | 24.2 | 24.2 |
| 1.0-5.0 Billion | 47 | 19.3 | 43.4 |
| 5.0-10 Billion | 80 | 32.8 | 76.2 |
| Above 10 Billion | 58 | 23.8 | 100.0 |
| Total | 244 | 100.0 | |

Table 4.5 shows majority of the Steel Manufacturing companies in Kenya (32.8%) had annual turnover of between 5.0-10 billions, 24.2% of these companies had an annual turnover of less than 1.0 billion, 23.8% of the companies had turnover

above 10 billions and only 19.3% of these companies had turnover between 1.0-5.0 billion.

4.4.6 Company's Years of Operation in Kenya

Understanding the number of years the company has been operating in Kenya was important because company's performance improves with age, and ageing firms have steadily increasing levels of productivity and higher profits (Coad *et al.* 2010).

Table 4.6: Number of Years of Operations in Kenya

| Number of Year of Operation | Frequency | Percent | Cumulative Percent |
|------------------------------------|------------------|----------------|---------------------------|
| 11-20 Years | 69 | 28.3 | 28.3 |
| 21-30 Years | 36 | 14.8 | 43.0 |
| 31-40 Years | 47 | 19.3 | 62.3 |
| 41-50 Years | 23 | 9.4 | 71.7 |
| Above 50 Years | 69 | 28.3 | 100.0 |
| Total | 244 | 100.0 | |

Table 4.6 shows majority of the Steel Manufacturing companies in Kenya (28.3%) have operated in Kenya for 11-20 years and above 50 years respectively. 19.3% of these companies have operated for 31-40 years, 14.8% of the companies have operated between 21-30 years and only 9.4% have operated for 41-50 years. This implies that majority of these companies were established in early 2000's and in early 1970's.

Coad *et al.* (2010) examined the impact of age on firm's performance in Spanish manufacturing firms in the period between 1998 and 2006. They found that firms improve with age, and argue that ageing firms are observed to have steadily increasing levels of productivity and higher profits.

4.4.7 Incorporation of supply Chain Management Practice

Table 4.7: Company incorporation of Supply Chain Management Practices

| Response | Frequency | Percent | Cumulative Percent |
|-----------------|------------------|----------------|---------------------------|
| Yes | 172 | 70.5 | 70.5 |
| No | 72 | 29.5 | 100.0 |
| Total | 244 | 100.0 | |

As shown in the table 4.7, most of the companies (70.5%) have incorporated Supply Chain management practices except the few (29.5%) have not incorporated supply chain management practices.

4.4.8 Type of supply Chain Management practices incorporated in your Company

Table 4.8: Supply Chain Management practices incorporated in your Company

| SCM practices incorporated in your company | Frequency | Percent | Cumulative Percent |
|--|------------------|----------------|---------------------------|
| Collaboration, Info Sharing and CRM Practices | 46 | 18.9 | 18.9 |
| Collaboration, Information Sharing, GSCM and CRM Practices | 198 | 81.1 | 100.0 |
| Total | 244 | 100.0 | |

From the table 4.8, majority (81.1%) of Steel manufacturing Companies in Kenya have incorporated the four Supply Chain Management practices that include Supply Chain Collaboration, Information Sharing, Green Supply Chain Management and Customer relationship management practices and the remaining 18.9% have only incorporated the three SCM practices that include Supply Chain Collaboration, Information Sharing and Customer Relationship Management practices

4.5 Results on the contribution of Supply Chain Collaboration practice on the performance of Steel Manufacturing Companies in Kenya

This section deals with the perception, rate of implementation and the level of incorporation of Supply Chain collaboration Practice on the performance of steel manufacturing companies in Kenya

Table 4.9: Do you think SCC Practice contributes to performance?

| Response | Frequency | Percent | Cumulative Percent |
|-----------------|------------------|----------------|---------------------------|
| Yes | 159 | 65.2 | 65.2 |
| No | 85 | 34.8 | 100.0 |
| Total | 244 | 100.0 | |

As shown in table 4.9, majority of the respondents, 65.2% agreed that Supply Chain Collaboration Practice contributes to performance of Steel Manufacturing Companies in Kenya.

This result is consistent with previous research by Holweg (2005), which established that increased collaboration will lead to a seamless, synchronized supply chain, which in turn will lead to improved customer service, lower costs and higher profits.

Table 4.10: How do you rate the implementation of Supply Chain Collaboration Practice

| Rating | Frequency | Percent | Cumulative Percent |
|---------------|------------------|----------------|---------------------------|
| Terrible | 16 | 6.6 | 6.6 |
| Poor | 23 | 9.4 | 16.0 |
| Fair | 63 | 25.8 | 41.8 |
| Good | 119 | 48.8 | 90.6 |
| Excellent | 23 | 9.4 | 100.0 |
| Total | 244 | 100.0 | |

As shown in table 4.10, a significant percentage (48.8%) of respondents rated the implementation of Supply chain collaboration practice in their company as good, 9.4% rated excellent and 25.8% of them considered the implementation of SCC practice as fair. Only 9.4% of respondents rated the implementation of SCC as poor and 6.6% rated as terrible.

4.5.1 Results on the level of incorporation of Supply Chain Collaboration practice in Steel Manufacturing Companies in Kenya

Table 4.12 shows the level of incorporation of Supply Chain Collaboration Practice in Steel Manufacturing Companies in Kenya. Majority 70.9% supported the idea that their company has standardized means of communication across all functions in their company and that of their suppliers, 65.2% agreed that their company has a clear policy on managing the relationship with their suppliers and 64.8% agreed that their company relationship with their suppliers is based on mutual understanding and mutual goals. Only 44.3% of respondents agreed that there is a clear coordination and resource sharing between their company and the company's suppliers and lastly 63.5% of the respondents agreed that their company has developed the system to monitor their suppliers' performance.

Table 4.11: Supply Chain Collaborative Practice (SCC)

| Supply Chain Collaborative Practice (SCC) X1 | SA | A | N | D | SD |
|---|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. My company involves our suppliers in joint planning and forecasting process | 11.9 | 46.3 | 21.3 | 10.7 | 9.8 |
| 2. My company relationship with our suppliers is based on mutual understanding and mutual goals | 14.8 | 50.0 | 16.8 | 10.2 | 8.2 |
| 3. My company has a clear policy on managing the relationship with suppliers | 16.4 | 48.8 | 18.0 | 7.8 | 9.0 |
| 4. My company has developed the system to monitor the suppliers performance | 13.9 | 49.6 | 24.2 | 5.7 | 6.6 |
| 5. There is a clear coordination and resource sharing between my company and our suppliers | 4.5 | 39.8 | 38.1 | 12.3 | 5.3 |
| 6. There is standardized means of communication across all functions in my and our suppliers | 10.2 | 60.7 | 15.6 | 8.2 | 5.3 |

SD= Strongly Disagree; D= Disagree; N= Neutral; A=Agree; SA= Strongly Agree

From the analysis in Table 4.11, it can be concluded that an increase in Supply chain collaborative practice such as involvement of suppliers in joint planning and forecasting; having clear policy on managing the relationship with suppliers; clear coordination and resource sharing between the company and suppliers; having standardized means of communication across all functions inside the company and their suppliers and lastly having relationship with suppliers based on mutual understanding and mutual goals will significantly contribute to the performance of Steel manufacturing companies in Kenya.

This result is consistent with previous research by Simatupang and Sridharan (2002) who considered supply chain collaboration as a chain of two or more members working together to create a competitive advantage through sharing information, making joint decisions, and sharing benefits which result from greater profitability of satisfying end customer needs than acting alone.

Tan *et al.* (2002) asserts that early supplier involvement in product design can offer cost effective design alternatives assist in selecting better components and technologies and aid in design assessment. Supplier involvement in product development allows firms to make use of their suppliers' capabilities and technology to deliver competitive products (Handfield & Nichols, 2003).

4.6 Results on the contribution of Green Supply Chain Management practice on the performance of Steel Manufacturing Companies in Kenya

This section deals with the perception, rate of implementation and the level of incorporation of Green Supply Chain Management Practice on the performance of steel manufacturing companies in Kenya

Table 4.12: Do you think GSCM Practice contributes to performance of your company?

| Response | Frequency | Percent | Cumulative Percent |
|-----------------|------------------|----------------|---------------------------|
| Yes | 177 | 72.5 | 72.5 |
| No | 67 | 27.5 | 100.0 |
| Total | 244 | 100.0 | |

From the results in table 4.12, majority of the respondents, 72.5% agreed that Green supply chain management Practice contributes to performance of Steel Manufacturing Companies in Kenya.

Table 4.13: How do you rate the implementation of Green Supply Chain Management Practice?

| Rating | Frequency | Percent | Cumulative Percent |
|---------------|------------------|----------------|---------------------------|
| Terrible | 21 | 8.6 | 8.6 |
| Poor | 30 | 12.3 | 20.9 |
| Fair | 65 | 26.6 | 47.5 |
| Good | 112 | 45.9 | 93.4 |
| Excellent | 16 | 6.6 | 100.0 |
| Total | 244 | 100.0 | |

As shown in table 4.13, a significant percentage (45.9%) of respondents rated the implementation of Green Supply chain management practice in their company as good, 8.6% rated excellent and 26.6% of them considered the implementation of GSCM practice as fair. Only 12.3% of respondents rated the implementation of GSCM as poor and 8.6% rated as terrible

4.6.1 Results on the level of incorporation of Green Supply Chain Management practice in Steel Manufacturing Companies in Kenya

From analysis in Table 4.14, most of respondents (66%) responded that their company conducts periodically environmental audit, 63.5% agreed that their company has developed a policy on green supply Chain Management Practices to guide suppliers and the Company on GSCM. On the issue of their company optimizing the packaging processes to reduce cost, 61.9% of the respondents agreed.

Table 4.14: Green supply chain management practice

| Green Supply Chain Management Practice (GSCM) X2 | SA | A | N | D | SD |
|--|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. My company has developed a policy on green supply Chain Management Practices to guide suppliers and the Company on GSCM | 8.6 | 54.9 | 24.2 | 6.6 | 5.7 |
| 2. My company optimizes the packaging processes to reduce cost | 8.2 | 53.7 | 27.0 | 5.7 | 5.3 |
| 3. My company conducts periodically environmental audit | 7.0 | 59.0 | 23.0 | 6.1 | 4.9 |

SD= Strongly Disagree; D= Disagree; N= Neutral; A=Agree; SA= Strongly Agree

From the analysis in table 4.14, Green Supply chain management practice such as development a policy on green supply Chain Management Practices to guide suppliers and the Company on GSCM, optimizing the packaging processes and conducting periodically environmental audit can significantly contribute to the performance of Steel manufacturing companies in Kenya.

Jamal (2009) argued in his findings on green supply management that GSCM helps improve organizational performance. The findings of the study showed that green supply chain practices have positive contribution to economic performance. Previous studies by Choi and Zhang (2011), established a positive relationship between green corporate strategy and business performance. These findings were supported by a study on Green supply chain management practices and performance of firms in automotive industry in Nairobi that confirmed that green supply chain management practices contribute to the improved performance (Jemutai, 2014).

4.7 Results on the contribution of Information sharing practice on the performance of Steel Manufacturing Companies in Kenya

This section deals with the perception, rate of implementation and the level of incorporation of Information Sharing Practice on the performance of steel manufacturing companies in Kenya

Table 4.15: Do you think IS Practice contributes to performance of your company?

| Response | Frequency | Percent | Cumulative Percent |
|-----------------|------------------|----------------|---------------------------|
| Yes | 201 | 82.4 | 82.4 |
| No | 43 | 17.6 | 100.0 |
| Total | 244 | 100.0 | |

From the results in table 4.15, majority of the respondents, 82.4% agreed that information sharing Practice contributes to the performance of Steel Manufacturing Companies in Kenya.

Table 4.16: How do you rate the implementation of Information Sharing Practice

| Rating | Frequency | Percent | Cumulative Percent |
|---------------|------------------|----------------|---------------------------|
| Terrible | 14 | 5.7 | 5.7 |
| Poor | 26 | 10.7 | 16.4 |
| Fair | 57 | 23.4 | 39.8 |
| Good | 137 | 56.1 | 95.9 |
| Excellent | 10 | 4.1 | 100.0 |
| Total | 244 | 100.0 | |

As shown in table 4.16, Majority (56.1%) of respondents rated the implementation of Information sharing practice in their company as good, 4.1% rated excellent and 23.4% of them considered the implementation of information sharing practice as fair. Only 10.7% of respondents rated the implementation of IS as poor and 5.7% rated as terrible

4.7.1 Results on the level of incorporation of information sharing practice in Steel Manufacturing Companies in Kenya

On the level of incorporating information sharing Practice in Steel Manufacturing Companies in Kenya as shown in Table 4.18, Most of respondents 59.8% said that their company has developed the policy to guide on information sharing within and outside their organization; 59.4% agreed that their company has fully invested in the state of the art Information System to enable information Sharing within and outside their company and only 57.8% who said that their order fulfillment and shipment status of their company are tracked at each step across the supply chain.

Majority (57.4%) of respondents having agreed that their production and delivery schedules of their company are shared across the company's supply chain, 57% of the said that the performance metrics of their company are shared across the company's supply chain. Only 56.5% agreed that their company information systems are integrated with key clients

Table 4.17: Information sharing Practice

| Information Sharing Practice (IS) X3 | SA | A | N | D | SD |
|--|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. My company has developed the policy to guide on information sharing within and outside our organization. | 4.1 | 55.7 | 25.0 | 11.1 | 4.1 |
| 2. My company has fully invested in the state of the art Information System to enable information Sharing within and outside our company | 3.7 | 55.7 | 25.0 | 11.5 | 4.1 |
| 3. Production and delivery schedules of our company are shared across the company's supply chain | 3.7 | 53.7 | 27.5 | 9.8 | 5.3 |
| 4. Performance metrics of our company are shared across the company's supply chain. | 3.7 | 53.3 | 27.9 | 10.7 | 4.5 |
| 5. Order fulfillment and shipment status of our company are tracked at each step across the supply chain | 4.1 | 53.7 | 26.6 | 11.1 | 4.9 |
| 6. Our company information systems are integrated with key clients | 4.5 | 52.0 | 27.9 | 11.5 | 4.5 |

SD= Strongly Disagree; D= Disagree; N= Neutral; A=Agree; SA= Strongly Agree

From the analysis in Table 4.17, it can be concluded that information Sharing practice such as development of the policy to guide on information sharing within and outside the organization, investing in the state of the art Information System to enable information Sharing within and outside the company, sharing production, delivery schedules and performance metrics of the company across the company's supply chain, tracking the order fulfillment and shipment status of the company across supply chain and lastly integrating the company's information systems with

the key clients significantly contribute to the performance of Steel manufacturing companies in Kenya.

The results are in agreement with Sundarraj and Talluri (2003) argument that sharing and coordination of information across the Supply Chain at the right time is major factors to improving the performance of an organization. Harmonized information systems between supply chain partners create a timely, relevant and high-quality information flow leading to elimination of unnecessary activities and enhanced delivery of product to customer (Brewer & Speh, 2000). Information provides the visibility needed to make decisions that improve the company and overall supply chain performance (Chopra & Meindl, 2015).

4.8 Results on the contribution of Customer Relationship Management practice on the performance of Steel Manufacturing Companies in Kenya

This section deals with the perception, rate of implementation and the level of incorporation of Customer Relationship Management Practice on the performance of steel manufacturing companies in Kenya

Table 4.18: Do you think CRM Practice contributes to performance of your company?

| Response | Frequency | Percent | Cumulative Percent |
|-----------------|------------------|----------------|---------------------------|
| Yes | 213 | 87.3 | 87.3 |
| No | 31 | 12.7 | 100.0 |
| Total | 244 | 100.0 | |

From the results in table 4.18, majority of the respondents, 87.3% agreed that Customer relationship management practice contributes to the performance of Steel Manufacturing Companies in Kenya

Table 4.19: How do you rate the implementation of Customer Relationship management practice?

| Rating | Frequency | Percent | Cumulative Percent |
|---------------|------------------|----------------|---------------------------|
| Terrible | 7 | 2.9 | 2.9 |
| Poor | 16 | 6.6 | 9.4 |
| Fair | 71 | 29.1 | 38.5 |
| Good | 140 | 57.4 | 95.9 |
| Excellent | 10 | 4.1 | 100.0 |
| Total | 244 | 100.0 | |

Table 4.19 shows majority (57.4%) of respondents rated the implementation of customer relationship management practice in their company as good, 4.1% rated excellent, 29.1% of them rated fair, 6.6% of respondents rated poor and only 2.9% rated as terrible.

4.8.1 Results on the level of incorporation of Customer Relationship Management practice in Steel Manufacturing Companies in Kenya

From the finding as shown in table 4.21, Majority (70.5%) of the respondents agreed that their company has documented procedures to deal with customer complains; 68% said that Customer satisfaction criterion is used to evaluate the performance their Company and 61.9% agreed that their company has developed accounts for their key customers.

Also 59.8% of respondents said that their company solicits customers' inputs in their products design; 53.7% agreed that their company offers after sales service to our clients and only 52.1% who said that their company conducts training to their customers

Table 4.20: Customer Relationship Management Practice

| Customer Relationship Management(CRM) Practice X4 | SA | A | N | D | SD |
|--|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. My company has documented procedures to deal with customer complains | 3.7 | 66.8 | 24.2 | 4.1 | 1.2 |
| 2. My company offers after sales service to our clients. | 3.3 | 50.4 | 38.1 | 6.6 | 1.6 |
| 3. My company solicits customers inputs in the products design | 3.7 | 56.1 | 33.6 | 4.5 | 2.0 |
| 4. My company conducts training to our customers | 3.7 | 48.4 | 36.1 | 9.8 | 2.0 |
| 5. My company has developed accounts for our key customers | 2.9 | 59.0 | 28.7 | 7.0 | 2.5 |
| 6. Customer satisfaction criterion is used to evaluate the performance our Company | 2.0 | 66.0 | 25.8 | 4.1 | 2.0 |

SD= Strongly Disagree; D= Disagree; N= Neutral; A=Agree; SA= Strongly Agree

Table 4.20 reveals that that customer relationship management practice such as establishing documented procedures to deal with customer complaints, offering after sales service to clients, soliciting customer inputs in product design, developing accounts for key customers, training customer and using customer satisfaction criterion is used to evaluate the performance our Company has significant contribution to the performance of Steel manufacturing companies in Kenya.

Table 4.21: Do you think your company offers Customer Satisfaction?

| Response | Frequency | Percent | Cumulative Percent |
|-----------------|------------------|----------------|---------------------------|
| Yes | 214 | 87.7 | 87.7 |
| No | 30 | 12.3 | 100.0 |
| Total | 244 | 100.0 | |

From the results in table 4.21, majority (87.7%) of the respondents agreed that their company offers customer satisfaction.

Table 4.22: How do you rate the level of Customer Satisfaction in your company?

| Rating | Frequency | Percent | Cumulative Percent |
|---------------|------------------|----------------|---------------------------|
| Terrible | 9 | 3.7 | 3.7 |
| Poor | 14 | 5.7 | 9.4 |
| Fair | 59 | 24.2 | 33.6 |
| Good | 146 | 59.8 | 93.4 |
| Excellent | 16 | 6.6 | 100.0 |
| Total | 244 | 100.0 | |

As shown in table 4.22, Majority (59.8%) of respondents rated the level of customer satisfaction in their company as good, 6.6% rated excellent, 24.2% of them rated as fair, 5.7% of respondents rated as poor and 3.7% rated as terrible

4.9 Results on the level of performance in terms of customer satisfaction of Steel Manufacturing Companies in Kenya

From analysis in table 4.23, most of respondents (66.8%) said that there has been increased number of referral for their Company's products; 66.4% agreed that customer retention rate of their company has gone up and majority (65.6%) confirmed that customer acquisition rate of their company has improved.

Table 4.23: Performance in terms of Customer Satisfaction

| Performance in terms of Customer Satisfaction | SA | A | N | D | SD |
|---|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. Customer retention rate of my company has gone up | 5.7 | 60.7 | 24.2 | 5.7 | 3.7 |
| 2. Customer acquisition rate of my company has improved | 7.0 | 58.6 | 25.4 | 5.3 | 3.7 |
| 3. There has been increased number of referral for our Company's products | 7.4 | 59.4 | 24.6 | 5.3 | 3.3 |

SD= Strongly Disagree; D= Disagree; N= Neutral; A=Agree; SA= Strongly Agree

Table 4.24: Do you think your company offers Quality products to its clients?

| Response | Frequency | Percent | Cumulative Percent |
|-----------------|------------------|----------------|---------------------------|
| Yes | 199 | 81.6 | 81.6 |
| No | 45 | 18.4 | 100.0 |
| Total | 244 | 100.0 | |

From the results in table 4.24, majority of the respondents (81.6%) agreed that their company offers quality products to its clients.

Table 4.25: How do you rate the quality of products in your company?

| Rating | Frequency | Percent | Cumulative Percent |
|---------------|------------------|----------------|---------------------------|
| Terrible | 4 | 1.6 | 1.6 |
| Poor | 32 | 13.1 | 14.8 |
| Fair | 66 | 27.0 | 41.8 |
| Good | 126 | 51.6 | 93.4 |
| Excellent | 16 | 6.6 | 100.0 |
| Total | 244 | 100.0 | |

From the table 4.25, Majority (51.6%) of respondents rated the level of quality of products in their company as good, 6.6% rated excellent, 27.0% of them rated as fair, 13.1% of respondents rated as poor and 1.6% rated as terrible

4.10 Results on the level of performance in terms of Product Quality of Steel Manufacturing Companies in Kenya

As shown in the Table 4.26, majority of respondents (68.6%) agreed that number of products returned by our clients have reduced and number of Customer Complaints have gone down in their company. 56.6% said that number of failures or reject rates have reduced in their company.

Table 4.26: Performance in terms of Product Quality

| Performance in terms of Product Quality | SA | A | N | D | SD |
|--|-----------|----------|----------|----------|-----------|
| | % | % | % | % | % |
| 1. Number of failures or reject rates have reduced in my company | 7.0 | 49.6 | 27.9 | 12.7 | 2.9 |
| 2. Number of products returned by our clients have reduced | 7.0 | 51.6 | 26.6 | 12.7 | 2.0 |
| 3. Number of Customer Complaints have gone down in our company | 6.6 | 52.0 | 27.5 | 12.7 | 1.2 |

SD= Strongly Disagree; D= Disagree; N= Neutral; A=Agree; SA= Strongly Agree

Table 4.27: Rating of the general performance of Steel Manufacturing Companies in Kenya

| Rating | Frequency | Percent | Cumulative Percent |
|---------------|------------------|----------------|---------------------------|
| Terrible | 10 | 4.1 | 4.1 |
| Poor | 16 | 6.6 | 10.7 |
| Fair | 62 | 25.4 | 36.1 |
| Good | 140 | 57.4 | 93.4 |
| Excellent | 16 | 6.6 | 100.0 |
| Total | 244 | 100.0 | |

Table 4.27 shows a small percentage (4.1%) that rated the performance of Steel manufacturing companies in Kenya as terrible, 6.6% rated poor and majority (57.4%) rated the performance of steel manufacturing companies in Kenya as good. Only 25.4% of responded rated the performance as fair and 6.6% rated it as excellent.

4.11 Correlation Results for Steel Manufacturing Companies in Kenya

The correlation analysis was carried out between the variables of the study using Pearson correlation coefficient. This was to test whether there existed interdependency between independent variables and also to examine if there exist significant relationship between the independent variables (Supply chain collaboration practice, Green supply chain management practice, Information sharing practice and Customer Relationship management practice) and the dependent variable that is performance of Steel manufacturing companies in Kenya

4.11.1 Test of Multicollinearity of Independent Variables

Table 4.28: Correlation Matrix of Independent variables

| Variables | Test | SCC Practice | GSCM Practice | IS Practice | CRM Practice |
|---------------|---------------------|--------------|---------------|-------------|--------------|
| SCC Practice | Pearson Correlation | 1 | .570** | .269** | .318** |
| | Sig. (2-tailed) | | .000 | .000 | .000 |
| | N | 244 | 244 | 244 | 244 |
| GSCM Practice | Pearson Correlation | .570** | 1 | .272** | .161* |
| | Sig. (2-tailed) | .000 | | .000 | .012 |
| | N | 244 | 244 | 244 | 244 |
| IS Practice | Pearson Correlation | .269** | .272** | 1 | .247** |
| | Sig. (2-tailed) | .000 | .000 | | .000 |
| | N | 244 | 244 | 244 | 244 |
| CRM Practice | Pearson Correlation | .318** | .161* | .247** | 1 |
| | Sig. (2-tailed) | .000 | .012 | .000 | |
| | N | 244 | 244 | 244 | 244 |

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

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

When the variables were correlated among themselves, all were found to be associated as shown in the table 4.29. Supply Chain Collaboration (SCC) Practice was positively and statistically significant correlated to Green Supply Chain Management (GSCM) practice ($r = 0.570$, $p < 0.01$); Information Sharing (IS) Practice ($r = 0.269$, $p < 0.01$) and to Customer Relationship Management (CRM) ($r = 0.318$, $p < 0.01$). Green Supply Chain Management (GSCM) practice was positively and significantly correlated to Information Sharing (IS) Practice ($r = 0.272$, $p < 0.01$); to Customer Relationship Management (CRM) ($r = 0.161$, $p < 0.05$). Finally, Information Sharing (IS) Practice was positively and significantly correlated to Customer Relationship Management (CRM) ($r = 0.247$, $p < 0.01$).

From Table 4.28, the correlation among variables is less than $r < 0.6$ and hence the problem of multicollinearity was minimized. When there is multicollinearity among independent variables, the analysis cannot distinguish the effects of one variable over

the other (Norusis, 2009). A common rule of thumb is that correlations among the independent variables should be less than 0.70 to remove the difficulties in regression analysis (Lind *et al.*, 2011).

Table 4.29: Correlation of SCM practices and Performance in Term of Customer Satisfaction

| Variables | Test | SCC Practice X ₁ | GSCM Practice X ₂ | IS Practice X ₃ | CRM Practice X ₄ | Performance in term of Customer Satisfaction |
|--|---------------------|--------------------------------|---------------------------------|-------------------------------|--------------------------------|--|
| SCC Practice X ₁ | Pearson Correlation | 1 | .570** | .269** | .318** | .358** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| GSCM Practice X ₂ | Pearson Correlation | .570** | 1 | .272** | .161* | .368** |
| | Sig. (2-tailed) | .000 | | .000 | .012 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| IS Practice X ₃ | Pearson Correlation | .269** | .272** | 1 | .247** | .396** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| CRM Practice X ₄ | Pearson Correlation | .318** | .161* | .247** | 1 | .442** |
| | Sig. (2-tailed) | .000 | .012 | .000 | | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| Performance in terms of Customer Service | Pearson Correlation | .358** | .368** | .396** | .442** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | |
| | N | 244 | 244 | 244 | 244 | 244 |

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

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

A correlation analysis was run as shown in the table.30 to predict the relationship between supply chain management practices and the performance of Steel manufacturing companies in Kenya in terms of customer satisfaction. The analysis revealed that there is a significant and a moderate positive correlation between Supply Chain Collaboration (SCC) practice X_1 and the performance of Steel Manufacturing companies in Kenya in terms of Customer satisfaction ($r = 0.358$, $p < 0.01$); Green Supply Chain Management (GSCM) practice X_2 and the performance of Steel Manufacturing companies in Kenya in terms of Customer satisfaction ($r = 0.368$, $p < 0.01$); Information Sharing (IS) practice X_3 and the performance of Steel Manufacturing companies in Kenya in terms of Customer satisfaction ($r = 0.396$, $p < 0.01$) and lastly the correlation between Customer Relationship Management (CRM) practice X_4 and the performance of Steel Manufacturing companies in Kenya in terms of Customer satisfaction is significant and a moderate positive with ($r = 0.442$, $p < 0.01$).

Table 4.30: Correlation of SCM practice and Performance in Term of Product Quality

| Variables | Test | SCC Practice X ₁ | GSCM Practice X ₂ | IS Practice X ₃ | CRM Practice X ₄ | Performance in terms of Product Quality |
|---|---------------------|-----------------------------|------------------------------|----------------------------|-----------------------------|---|
| SCC Practice X ₁ | Pearson Correlation | 1 | .570** | .269** | .318** | .447** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| GSCM Practice X ₂ | Pearson Correlation | .570** | 1 | .272** | .161* | .448** |
| | Sig. (2-tailed) | .000 | | .000 | .012 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| IS Practice X ₃ | Pearson Correlation | .269** | .272** | 1 | .247** | .274** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| CRM Practice X ₄ | Pearson Correlation | .318** | .161* | .247** | 1 | .198** |
| | Sig. (2-tailed) | .000 | .012 | .000 | | .002 |
| | N | 244 | 244 | 244 | 244 | 244 |
| Performance in terms of Product Quality | Pearson Correlation | .447** | .448** | .274** | .198** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .002 | |
| | N | 244 | 244 | 244 | 244 | 244 |

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

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

Table 4.30 shows the results of correlation analysis for SCM practices and Performance of Steel Manufacturing Companies in Kenya in Term of Product Quality which indicates that there is a significant and a moderate positive correlation between Supply Chain Collaboration (SCC) practice X₁ and the performance of Steel Manufacturing companies in Kenya in terms of product quality ($r = 0.447$, $p < 0.01$); Green Supply Chain Management (GSCM) practice X₂ and the performance of Steel Manufacturing companies in Kenya in terms of product quality ($r = 0.448$, $p < 0.01$); Information Sharing (IS) practice X₃ and the performance of Steel Manufacturing companies in Kenya in terms of product quality ($r = 0.274$, $p < 0.01$)

and lastly the correlation between Customer Relationship Management (CRM) practice X_4 and the performance of Steel Manufacturing companies in Kenya in terms of product quality is significant and moderate positive correlation with ($r = 0.198, p < 0.01$).

Table 4.31: Correlation of SCM Practices and the performance of Steel Manufacturing Companies in Kenya

| Variables | Test | SCC Practice X_1 | GSCM Practice X_2 | IS Practice X_3 | CRM Practice X_4 | Performance of Steel Manufacturing Companies in Kenya |
|---|---------------------|--------------------|---------------------|-------------------|--------------------|---|
| SCC Practice X_1 | Pearson Correlation | 1 | .570** | .269** | .318** | .382** |
| | Sig. (2-tailed) | | .000 | .000 | .000 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| GSCM Practice X_2 | Pearson Correlation | .570** | 1 | .272** | .161* | .379** |
| | Sig. (2-tailed) | .000 | | .000 | .012 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| IS Practice X_3 | Pearson Correlation | .269** | .272** | 1 | .247** | .359** |
| | Sig. (2-tailed) | .000 | .000 | | .000 | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| CRM Practice X_4 | Pearson Correlation | .318** | .161* | .247** | 1 | .471** |
| | Sig. (2-tailed) | .000 | .012 | .000 | | .000 |
| | N | 244 | 244 | 244 | 244 | 244 |
| Performance of Steel Manufacturing Companies in Kenya | Pearson Correlation | .382** | .379** | .359** | .471** | 1 |
| | Sig. (2-tailed) | .000 | .000 | .000 | .000 | |
| | N | 244 | 244 | 244 | 244 | 244 |

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

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

From the table 4.31, A Pearson correlation analysis results indicate that there is a significant and a moderate positive correlation between Supply Chain Management practices and the performance of Steel Manufacturing companies in Kenya. There is a significant and a moderate positive correlation between Supply Chain Collaboration (SCC) practice X_1 and the performance of Steel Manufacturing companies in Kenya ($r = 0.382$, $p < 0.01$); Green Supply Chain Management (GSCM) practice X_2 and the performance of Steel Manufacturing companies in Kenya ($r = 0.379$, $p < 0.01$); Information Sharing (IS) practice X_3 and the performance of Steel Manufacturing companies in Kenya ($r = 0.359$, $p < 0.01$) and lastly the correlation between Customer Relationship Management (CRM) practice X_4 and the performance of Steel Manufacturing companies in Kenya is significant and moderate positive correlation with ($r = 0.471$, $p < 0.01$)

4.12 Regression Results for Steel Manufacturing Companies in Kenya

Correlation is the degree of relationship existing between economic variables. Both correlation and regression analysis can be used to examine the presence of a linear relationship between two variables. But correlation analysis has some limitations since it cannot establish a functional relationship by proving the variable that is dependent and the one that is explanatory. It also does not give the numerical values for the coefficients of relationship and hence failing to give estimates for the slope and the constant intercept of the function. Correlation does not imply causation. To strengthen the case for causality consideration must be given to other possible underlying variables and to whether the relationship holds in other populations and hence the need for further statistical analysis such as regression analysis to help establish specific nature of the relationships.

Multiple regression analysis is used when one is interested in predicting a continuous dependent variable from a number of independent variables. It shows the percentage of the total variation of the dependent variable that can be explained by the independent variables and this is assessed using the coefficient of determination (R^2) which is used for judging the explanatory power of the linear regression of dependent variable on independent variables. R^2 is a measure of the goodness of fit of the

regression line to the observed sample values of dependent and independent variables. The R^2 can range from 0.0 to 1.0, with 1.0 showing a perfect fit that indicates that each point is on the line (Carver *et al.*, 2009).

Adjusted R Square (R^2) adjusts the value of R^2 when the sample size is small since the estimate of R^2 obtained when the sample size is small tends to be higher than the actual R^2 in the population. The rule of thumb is to report adjusted R^2 when it substantially differs from R^2 (Green & Salkind, 2010).

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

Where

Y = Performance of Steel Manufacturing Company

$\beta_0, \beta_1, \beta_3, \beta_4$ = Coefficient of Performance of Steel manufacturing company equation

X_1 = Supply chain Collaboration practice

X_2 = Green Supply chain Management practice

X_3 = Information Sharing practice

X_4 = Customer Relationship Management practice

4.12.1 Linear regression model on the contributions of Supply chain collaboration practice on performance of steel manufacturing companies in Kenya

From the analysis in the table 4.32, the linear regression analysis models on the dependent variable which is performance of Steel manufacturing companies in Kenya and independent variable which is Supply chain collaboration practice, the coefficient of determination (R^2) and correlation coefficient (R) shows the degree of association between the supply chain collaboration practice and the performance of Steel manufacturing companies in Kenya. The results of the linear regression

indicate that $R^2=0.146$ and $R= 0.382$ this is an indication that there is a moderate linear relationship between supply chain collaboration practice and the performance of Steel manufacturing companies in Kenya. The independent variable can only explain 14.6% of variability of dependent variable.

Table 4.32: Model Summary for SCC practice

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .382 ^a | .146 | .142 | .80631 |

a. Predictors: (Constant), SCC Practice X_1

Table 4.32 shows the results of ANOVA test which reveals that the variable Supply Chain collaboration practice statistically significantly predicted the performance of Steel Manufacturing Companies in Kenya, $F(1, 242) = 41.319$, $p < .05$, $R^2 = .146$.

Table 4.33: ANOVAa (F-Test) Analysis for SCC practice

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|------------|----------------|-----|-------------|--------|-------------------|
| Regression | 26.863 | 1 | 26.863 | 41.319 | .000 ^b |
| 1 Residual | 157.334 | 242 | .650 | | |
| Total | 184.197 | 243 | | | |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

b. Predictors: (Constant), SCC Practice

From table 4.35, the linear regression model for Supply Chain collaboration practice,

$$Y = \beta_0 + \beta_1 X_1 + \epsilon$$

Where;

Y = Performance of Steel Manufacturing Company in Kenya

β_0 = Constant (Y- Intercept)

ϵ = Standard Error term

β_1 = Coefficient of Performance of Steel manufacturing company equation

X_1 = Supply chain collaboration practice

Performance of Steel Manufacturing Companies in Kenya $Y = 2.423 + 0.329$ Supply chain collaboration practice.

From regression results, a unit increase in Supply chain collaboration practice resulted in increase of 32.9% change in Performance of Steel manufacturing company. The general regression model will be $Y = 2.423 + 0.329X_1$

Table 4.34: Coefficientsa for SCC practice

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-----------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| 1 (Constant) | 2.423 | .184 | | 13.171 | .000 |
| SCC Practice X1 | .329 | .051 | .382 | 6.428 | .000 |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

4.12.2 Linear regression model on the contributions of Green Supply chain Management practice on performance of steel manufacturing companies in Kenya

Table 4.35 presents summary of regression model result. The value of R and R^2 are 0.379 and 0.143 respectively. The R value of 0.379 represents the moderate positive linear relationship between Green supply chain management practice and the performance of Steel manufacturing companies in Kenya. The R^2 indicates that explanatory power of the independent variable Green supply chain management practice is 0.143. This means that about 14.3% of the variation in performance of Steel manufacturing Companies in Kenya is explained by the model hence about 85.7% of the variation in the dependent variable is unexplained. It implies that the dependent variable is influenced by other independent variables.

Table 4.35: Model Summary for GSCM practice

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .379 ^a | .143 | .140 | .80746 |

a. Predictors: (Constant), GSCM Practice X2

Table 4.36 shows the results of ANOVA test which reveals that the variable Green Supply Chain management practice statistically significantly predicted the performance of Steel Manufacturing Companies in Kenya, $F(1, 242) = 40.516$, $p < .05$, $R^2 = .143$.

Table 4.36: ANOVAa (F-Test) Analysis for GSCM practice

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| | Regression | 26.416 | 1 | 26.416 | 40.516 | .000 ^b |
| 1 | Residual | 157.781 | 242 | .652 | | |
| | Total | 184.197 | 243 | | | |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

b. Predictors: (Constant), GSCM Practice

Table 4.37 shows the linear regression model for Green supply chain management practice, $Y = \beta_0 + \beta_2 X_2 + \epsilon$

Where;

Y = Performance of Steel Manufacturing Company in Kenya

β_0 = Constant (Y- Intercept)

ϵ = Random Error of the Model

β_2 = Coefficient of Performance of Steel manufacturing company equation

X_2 = Green Supply chain Management practice

Performance of Steel Manufacturing Company in Kenya = 2.288 + 0.359 Green Supply chain Management practice

From regression results, a unit increase in Green Supply chain Management practice resulted in increase of 35.9% change in Performance of Steel manufacturing company. The general regression model will be $Y = 2.288 + 0.359X_2$

Table 4.37: Coefficientsa for GSCM practice

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--------------------|-----------------------------|------------|---------------------------|--------|------|
| | B | Std. Error | Beta | | |
| (Constant) | 2.288 | .206 | | 11.111 | .000 |
| 1 GSCM Practice X2 | .359 | .056 | .379 | 6.365 | .000 |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

4.12.3 Linear regression model on the contributions of information sharing practice on performance of steel manufacturing companies in Kenya

Table 4.38 presents the linear regression analysis that shows a relationship between the dependent variable performance of steel manufacturing companies in Kenya and independent variable which is information sharing practice. The coefficient of determination R^2 and correlation coefficient r shows the degree of association between Information sharing practice and the performance of steel manufacturing companies in Kenya where $R = 0.359$ and $R^2 = 0.129$. This is an indication that there is a moderate linear relationship between Information sharing practice and the performance of Steel manufacturing companies in Kenya. The independent variable information sharing practice only explains 12.9% of the variability of the performance of Steel Manufacturing Companies in Kenya.

Table 4.38: Model Summary for Information Sharing practice

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .359 ^a | .129 | .126 | .81417 |

a. Predictors: (Constant), Information Sharing Practice

From the Table 4.39 above, the results from ANOVA test reveals that the variable information sharing practice statistically significantly predicts the performance of Steel Manufacturing Companies in Kenya, $F(1, 242) = 35.874$, $p < .05$, $R^2 = .129$.

Table 4.39: ANOVAa (F-Test) Analysis for Information Sharing practice

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| | Regression | 23.780 | 1 | 23.780 | 35.874 | .000 ^b |
| 1 | Residual | 160.416 | 242 | .663 | | |
| | Total | 184.197 | 243 | | | |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

b. Predictors: (Constant), IS Practice

Table 4.40 shows the linear regression model for information sharing practice, $Y = \beta_0 + \beta_3 X_3 + \epsilon$

Where;

Y = Performance of Steel Manufacturing Company in Kenya

β_0 = Constant (Y- Intercept)

ϵ = Random Error of the Model

β_3 = Coefficient of Performance of Steel manufacturing company equation

X_3 = Information sharing practice

Performance of Steel Manufacturing Company in Kenya = 2.421 + 0.332 Information sharing practice.

From regression results, a unit increase in Information sharing practice resulted in increase of 33.2% change in Performance of Steel manufacturing company. The general regression model will be $Y = 2.421 + 0.332X_3$

Table 4.40: Coefficients^a for Information Sharing practice

| Model | Unstandardized | | Standardized | t | Sig. |
|----------------|----------------|------------|--------------|--------|------|
| | Coefficients | | Coefficients | | |
| | B | Std. Error | Beta | | |
| 1 (Constant) | 2.421 | .197 | | 12.299 | .000 |
| IS Practice X3 | .332 | .055 | .359 | 5.990 | .000 |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

4.12.4 Linear regression model on the contributions of Customer Relationship Management practice on performance of steel manufacturing companies in Kenya

From table 4.41, the linear regression analysis models on the dependent variable which is performance of Steel manufacturing companies in Kenya and independent variable which is Customer Relationship Management practice. The coefficient of determination (R^2) and correlation coefficient (r) shows the degree of association between the Customer Relationship Management practice and the performance of Steel manufacturing companies in Kenya. The results of the linear regression indicate that $R^2=0.222$ and $R= 0.471$ this is an indication that there is a moderate linear relationship between Customer Relationship Management practice and the performance of Steel manufacturing companies in Kenya. The independent variable can only explain 22.2% of variability of dependent variable.

Table 4.41: Model Summary for Customer Relationship Management

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .471 ^a | .222 | .219 | .76954 |

a. Predictors: (Constant), CRM Practice

Table 4.42 shows results from ANOVA test shows that the variable Customer Relationship Management practice statistically significantly predicts the performance of Steel Manufacturing Companies in Kenya, $F(1, 242) = 69.044$, $p < .05$, $R^2 = .222$.

Table 4.42: ANOVAa (F-Test) Analysis for Customer Relationship Management

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|-----|-------------|--------|-------------------|
| 1 Regression | 40.887 | 1 | 40.887 | 69.044 | .000 ^b |
| 1 Residual | 143.310 | 242 | .592 | | |
| Total | 184.197 | 243 | | | |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

b. Predictors: (Constant), CRM Practice X_4

Table 4.43 shows the linear regression model for Customer Relationship Management, $Y = \beta_0 + \beta_4 X_4 + \epsilon$

Where;

Y = Performance of Steel Manufacturing Company in Kenya

β_0 = Constant (Y- Intercept)

ϵ = Random Error of the Model

β_4 = Coefficient of Performance of Steel manufacturing company equation

X_4 = Customer Relationship Management practice

Performance of Steel Manufacturing Company in Kenya $Y = 1.741 + 0.514$ Customer Relationship Management practice.

From regression results, a unit increase in Customer Relationship Management practice resulted in increase of 51.4% change in Performance of Steel manufacturing company. The general regression model will be $Y = 1.741 + 0.514X_4$

Table 4.43: Coefficients^a for Customer Relationship Management

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------|-----------------------------|------------|---------------------------|-------|-------|
| | B | Std. Error | Beta | | |
| 1 | (Constant) | 1.741 | .224 | 7.773 | .000 |
| | CRM Practice X_4 | .514 | .062 | .471 | 8.309 |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

4.12.5 Multiple Regression Results for the Contributions of Supply chain Management Practices on Performance in terms of Customer Satisfaction of Steel Manufacturing Companies in Kenya

Table 4.44 shows a multiple regression results that predict the performance in terms of customer satisfaction of Steel manufacturing companies in Kenya from Supply chain Management Practices; Supply chain collaborative practice (SCC) X_1 , Green supply chain management (GSCM) practice X_2 , Information Sharing (IS) practice X_3 and Customer Relationship management (CRM) practice X_4 . The results of the linear regression indicate that $R^2=0.595$ and $R= 0.771$ an indication that there is a strong linear relationship between Supply chain Management Practices and the performance in terms of Customer Satisfaction of Steel manufacturing companies in Kenya. The independent variables explained 59.5% of the variability of our dependent variable which is the performance in terms of Customer Satisfaction of Steel Manufacturing Companies in Kenya.

Table 4.44: Model Summary for performance in terms of customer satisfaction

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .771 ^a | .595 | .588 | .53557 |

a. Predictors: (Constant), CRM Practice X4, GSCM Practice X2, IS Practice X3, SCC Practice X1

Table 4.45 results from ANOVA test shows that the supply chain management practices statistically significantly predicted the performance in terms of Customer Satisfaction of Steel Manufacturing Companies in Kenya, $F(4, 239) = 87.619$, $p < .05$, $R^2 = .595$. All three variables added statistically significantly to the prediction, $p < .05$.

Table 4.45: ANOVAa (F-Test) Analysis for Performance in terms of Customer satisfaction

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| | Regression | 100.529 | 4 | 25.132 | 87.619 | .000 ^b |
| 1 | Residual | 68.553 | 239 | .287 | | |
| | Total | 169.082 | 243 | | | |

a. Dependent Variable: Performance in terms of customer satisfaction

b. Predictors: (Constant), CRM Practice X4, GSCM Practice X2, IS Practice X3, SCC Practice X1

From table 4.46, the linear regression model for performance in terms of customer satisfaction, $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$

Where;

Y = Performance in terms of customer satisfaction of Steel Manufacturing Company in Kenya;

β_0 = Constant (Y- Intercept)

ϵ = Random Error of the Model

$\beta_1, \beta_2, \beta_3, \beta_4$, = Coefficient of Performance in terms of customer satisfaction of Steel manufacturing company equation

X_1 = Supply chain collaboration practice

X_2 = Green supply chain management (GSCM) practice

X_3 =Information Sharing (IS) practice

X_4 = Customer Relationship Management practice

Performance of Steel Manufacturing Company in terms of Product Quality, $Y = 0.515 + 0.01$ Supply chain collaboration practice + 0.122 Green Supply chain Management practice + 0.121 Information Sharing practice + 0.632 Customer relationship management practice.

The general regression model arrived at was $Y = 0.515 + 0.01X_1 + 0.122X_2 + 0.121X_3 + 0.632X_4$

The Y- Intercept ($\beta_0 = 0.515$), predict that the Performance of Steel Manufacturing Companies in Kenya in terms of customer satisfaction when all other variables are zero, implying that without the independent variables that include; Supply chain collaboration practice, Green Supply chain Management practice, Information Sharing practice and Customer relationship management practice, the performance of Steel Manufacturing company will be 0.515

Regression results show that a unit change in Supply chain collaboration practice resulted to 1.0% increase in Performance of Steel Manufacturing Company in terms of Customer satisfaction; Unit change in Green Supply chain Management practice resulted to 12.2% increase in Performance of Steel Manufacturing Company in terms of satisfaction; Unit change in information sharing practice resulted to 12.1% increase in Performance of Steel Manufacturing Company in terms of satisfaction and a unit change in Customer Relationship Management practice resulted to 63.2% increase in Performance of Steel Manufacturing Company in terms of satisfaction.

Table 4.46: Coefficients for Performance in terms of Customer Satisfaction

| Model | Unstandardized | | Standardized | t | Sig. | |
|------------|------------------|------------|--------------|-------|--------|------|
| | Coefficients | | Coefficients | | | |
| | B | Std. Error | Beta | | | |
| (Constant) | .515 | .188 | | 2.746 | .006 | |
| 1 | SCC Practice X1 | .010 | .044 | .012 | .217 | .828 |
| | GSCM Practice X2 | .122 | .046 | .134 | 2.642 | .009 |
| | IS Practice X3 | .121 | .040 | .136 | 3.017 | .003 |
| | CRM Practice X4 | .632 | .046 | .658 | 13.872 | .000 |

a. Dependent Variable: Performance in terms of customer satisfaction

The beta (β) values allow us to compare the relative strength of each independent variable's relationship with the dependent variable. From the table above CRM Practice X4 ($\beta = 0.658$, $p < 0.05$) has the strongest relationship with the Performance in terms of customer satisfaction of Steel manufacturing Companies in Kenya, then followed by IS practice X₃ ($\beta = 0.136$, $p < 0.05$) and GSCM Practice X₂ ($\beta = 0.134$, $p < 0.05$) respectively. SCC practice with ($\beta = 0.012$, $p > 0.05$) could not significantly predict the Performance in terms of customer satisfaction of Steel manufacturing Companies in Kenya.

The findings concurs with Rajagopal and Sanchez (2005) who asserts that customer relationship management is the strategic process of shaping the interactions between a company and its customers with the goal of maximizing current and lifetime value of customers for the company as well as maximizing satisfaction for customers.

4.12.6 Multiple Regression Results for the Contributions of Supply chain Management Practices on Performance in terms of Product Quality

From table 4.47, Regression coefficients indicates that Supply chain collaborative practice (SCC) X1, Green supply chain management (GSCM) practice X2, Information Sharing (IS) practice X3 and Customer Relationship management (CRM) practice X4 predicts the performance Steel Manufacturing Companies in

Kenya in terms of product quality. The results of the linear regression indicate that $R^2=0.387$ and $R= 0.622$ an indication that there is a strong linear relationship between Supply chain Management Practices and the performance of Steel manufacturing companies in Kenya in terms of product quality. The independent variables explained 38.7% of the variability of our dependent variable which is the performance of Steel Manufacturing Companies in Kenya in terms of product quality.

Table 4.47: Model Summary for performance in terms of Product Quality

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .622 ^a | .387 | .377 | .70653 |

a. Predictors: (Constant), CRM Practice X4, GSCM Practice X2, IS Practice X3, SCC Practice X1

b. Dependent Variable: Performance in terms of Product Quality

From the Table 4.48 above, the results from ANOVA test reveals that the supply chain management practices statistically significantly predicts the performance of Steel Manufacturing Companies in Kenya in terms of Product Quality, $F(4, 239) = 37.744$, $p < .05$, $R^2 = .387$.

Table 4.48: ANOVAa (F-Test) Analysis for Performance in terms of Product Quality

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|-----|-------------|--------|-------------------|
| 1 | Regression | 75.364 | 4 | 18.841 | 37.744 | .000 ^b |
| | Residual | 119.304 | 239 | .499 | | |
| | Total | 194.668 | 243 | | | |

a. Dependent Variable: Performance in terms of Product Quality

b. Predictors: (Constant), CRM Practice X4, GSCM Practice X2, IS Practice X3, SCC Practice X1

Table 4.49 shows the linear regression model for performance of Steel Manufacturing Companies in Kenya in terms of Product Quality, $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \epsilon$

Where;

Y = Performance of Steel Manufacturing Company in Kenya in terms of product quality

β_0 = Constant (Y - Intercept)

ϵ = Random Error of the Model

$\beta_1, \beta_2, \beta_3, \beta_4$, = Coefficient of Performance in terms of customer satisfaction of Steel manufacturing company equation

X_1 = Supply chain collaboration practice

X_2 = Green supply chain management (GSCM) practice

X_3 = Information Sharing (IS) practice

X_4 = Customer Relationship Management practice

The findings as presented in the Table 4.49 shows that; Performance of Steel Manufacturing Companies in Kenya in terms of Product Quality = 0.985 + 0.314 Supply chain collaboration practice + 0.089 Green Supply chain Management practice + 0.070 Information Sharing practice + 0.381 Customer relationship management practice.

The general regression model arrived at was $Y = 0.985 + 0.314X_1 + 0.089X_2 + 0.070X_3 + 0.381X_4$

The Y - Intercept ($\beta_0 = 0.985$), predict that the Performance of Steel Manufacturing Companies in Kenya in terms of product Quality when all other variables are zero,

implying that without the independent variables that include; Supply chain collaboration practice, Green Supply chain Management practice, Information Sharing practice and Customer relationship management practice, the performance of Steel Manufacturing company will be 0.985.

Regression results show that a unit change in Supply chain collaboration practice resulted to 31.4% increase in Performance of Steel Manufacturing Company in terms of Product Quality; Unit change in Green Supply chain Management practice resulted to 8.9% increase in Performance of Steel Manufacturing Company in terms of Product Quality; Unit change in information sharing practice resulted to 7.0% increase in Performance of Steel Manufacturing Company in terms of Product Quality and a unit change in Customer Relationship Management practice resulted to 38.1% increase in Performance of Steel Manufacturing Company in terms of Product Quality.

Table 4.49: Coefficientsa for Performance in terms of Product Quality

| Model | Unstandardized | | Standardized | t | Sig. |
|--------------------|----------------|------------|--------------|-------|------|
| | Coefficients | | Coefficients | | |
| | B | Std. Error | Beta | | |
| (Constant) | .985 | .248 | | 3.977 | .000 |
| SCC Practice X1 | .314 | .058 | .359 | 5.418 | .000 |
| 1 GSCM Practice X2 | .259 | .061 | .266 | 4.261 | .000 |
| IS Practice X3 | .089 | .053 | .094 | 1.687 | .093 |
| CRM Practice X4 | .070 | .060 | .068 | 1.167 | .244 |

a. Dependent Variable: Performance in terms of Product Quality

From the Analysis in table 4.49, SCC Practice X₁ ($\beta = 0.359$, $p < 0.05$) has the strongest relationship with the Performance of Steel manufacturing Companies in Kenya in terms of product quality, the followed by GSCM practice X₂ ($\beta = 0.266$, $p < 0.05$). IS Practice X₃ ($\beta = 0.094$, $p > 0.05$) but CRM practice X₄ ($\beta = 0.068$, $p > 0.05$)

could not significantly predict the Performance of Steel manufacturing Companies in Kenya in terms of product quality.

4.12.7 Multiple Regression Results for the Contributions of Supply chain Management Practices on Performance of Steel Manufacturing Companies in Kenya

Table 4.50 shows a multiple regression results that predict the performance of Steel manufacturing companies in Kenya from Supply chain Management Practices; Supply chain collaborative practice (SCC) X₁, Green supply chain management (GSCM) practice X₂, Information Sharing (IS) practice X₃ and Customer Relationship management (CRM) practice X₄. The results of the linear regression indicate that $R^2 = 0.362$ and $R = 0.602$ indication that there is a strong linear correlation between Supply chain Management Practices and the performance of Steel manufacturing companies in Kenya. The independent variables explained 36.2% of the variability of our dependent variable which is the performance of Steel Manufacturing Companies in Kenya.

Table 4.50: Model Summary for performance of Steel Manufacturing Companies in Kenya

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .602 ^a | .362 | .351 | .70124 |

a. Predictors: (Constant), CRM Practice X₄, GSCM Practice X₂, IS Practice X₃, SCC Practice X₁

b. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

From the Table 4.51, the results from ANOVA test reveals that the supply chain management practices statistically significantly predicts the performance of Steel Manufacturing Companies in Kenya, $F(4, 239) = 33.895$, $p < .05$, $R^2 = .362$.

Table 4.51: ANOVAa (F-Test) Analysis for performance of Steel Manufacturing Companies in Kenya

| Model | Sum of Squares | df | Mean Square | F | Sig. |
|--------------|----------------|-----|-------------|--------|-------------------|
| 1 Regression | 66.670 | 4 | 16.668 | 33.895 | .000 ^b |
| Residual | 117.526 | 239 | .492 | | |
| Total | 184.197 | 243 | | | |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

b. Predictors: (Constant), CRM Practice X4, GSCM Practice X2, IS Practice X3, SCC Practice X1

The study also sought to determine the beta coefficient of the variables. The findings as presented in the Table 4.53 shows that; Performance of Steel Manufacturing Company = 0.573 + 0.123 Supply chain collaboration practice + 0.180 Green Supply chain Management practice + 0.169 Information Sharing practice + 0.381 Customer relationship management practice.

Table 4.52: Coefficients for performance of Steel Manufacturing Companies in Kenya

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|-------------------------------|-----------------------------|------------|---------------------------|-------|------|
| | B | Std. Error | Beta | | |
| (Constant) | .573 | .264 | | 2.172 | .031 |
| 1 SCC Practice X ₁ | .123 | .056 | .145 | 2.201 | .029 |
| GSCM Practice X ₂ | .180 | .060 | .190 | 2.987 | .003 |
| IS Practice X ₃ | .169 | .051 | .182 | 3.305 | .001 |
| CRM Practice X ₄ | .381 | .060 | .349 | 6.302 | .000 |

a. Dependent Variable: Performance of Steel Manufacturing Companies in Kenya

The general regression Model arrived at was $Y = 0.573 + 0.123X_1 + 0.180X_2 + 0.169X_3 + 0.381X_4$.

Where;

X_1 = Supply chain collaboration practice (SCC), X_2 = Green supply chain management (GSCM) practice, X_3 =Information Sharing (IS) practice, X_4 = Customer Relationship Management practice and Y = Performance of Steel Manufacturing Companies in Kenya.

Hence;

Performance of Steel Manufacturing Companies in Kenya = $0.573 + 0.123$ Supply chain collaboration practice + 0.180 Green Supply chain Management practice + 0.169 Information Sharing practice + 0.381 Customer relationship management practice.

The Beta Coefficients in the regression model show that all of the tested variables had positive relationship with performance of Steel Manufacturing Companies in Kenya with all the variables tested being statistically significant with p-values less than 0.05.

The findings implies that a unit change of X_1 (Supply chain collaboration practice) = 0.123, will results in to 0.123 change in the Performance of Steel Manufacturing Companies in Kenya; X_2 (Green Supply chain Management practice) = 0.180, will results in to 0.180 change in the Performance of Steel Manufacturing Companies in Kenya; X_3 (Information Sharing practice)= 0.169; will results in to 0.169 change in the Performance of Steel Manufacturing Companies in Kenya and finally X_4 (Customer relationship management practice) = 0.381, will results in to 0.381 change in the Performance of Steel Manufacturing Companies in Kenya.

The Y- Intercept ($\beta_0 = 0.573$), predict that the Performance of Steel Manufacturing Companies in Kenya when all other variables are zero, implying that without the independent variables that include; Supply chain collaboration practice, Green

Supply chain Management practice, Information Sharing practice and Customer relationship management practice, the performance of Steel Manufacturing companies in Kenya will be 0.573

From the table 4.52, CRM Practice X_4 with ($\beta = 0.349$, $p < 0.05$) has the strongest relationship with the Performance of Steel manufacturing Companies in Kenya, then followed by GSCM practice X_2 ($\beta = 0.190$, $p < 0.05$), IS Practice X_3 ($\beta = 0.182$, $p < 0.05$) and finally SCC practice X_1 ($\beta = 0.145$, $p < 0.05$) respectively. From the analysis all four independent variables (Supply chain management practices) statistically significantly predicted the Performance of Steel manufacturing Companies in Kenya. The multiple linear regression model showed that SCC practice, GSCM practice, IS practice and CRM practice had a significant contribution with p-values $X_1 = 0.029$, $X_2 = 0.003$, $X_3 = 0.001$ and $X_4 = 0.000$. The research therefore accepted the null hypothesis of the stated since the p- Values were less than 0.05.

Table 4.53: Summary of hypotheses test results

| Hypothesis | P-values | Decision |
|---|----------|----------|
| H₀₁ : There is a significant contribution of Supply chain collaboration practice on performance of steel manufacturing Companies in Kenya. | 0.029 | Accepted |
| H₀₂ : There is significant relationship between green supply chain management practice and the performance of steel manufacturing Companies in Kenya. | 0.003 | Accepted |
| H₀₃ : Information sharing practice contributes significantly on performance of steel manufacturing Companies in Kenya. | 0.001 | Accepted |
| H₀₄ : Customer relationship management practice contributes significantly on performance of Steel Manufacturing Companies in Kenya. | 0.000 | Accepted |

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents a summary of study's findings, conclusions and recommendations based on the findings. The chapter further summarizes and gives suggestions for further research in the field of Supply Chain management. The recommendations will help the industry players on how they can improve the performance of Steel Manufacturing Companies in Kenya for them to compete favorably in the dynamic global market.

5.2 Summary of the findings

The study sought to assess the contributions of supply chain management practices on performance of steel manufacturing Companies in Kenya. The specific objective of the study were; to determine the contributions of supply chain collaboration practice on performance of steel manufacturing Companies in Kenya; to examine the contributions of green supply chain management practice on performance of steel manufacturing Companies in Kenya; to investigate the contributions of information sharing practice on performance of Steel Manufacturing Companies in Kenya; to find out to what extent does customer relationship management practice contributes to performance of steel Manufacturing Companies in Kenya. The outcomes of the findings can be summarized based on the following research objectives.

5.2.1 Supply chain collaboration practice and Performance of steel manufacturing Companies in Kenya

The results indicate that Supply chain collaboration practice significantly contributes to the performance of Steel manufacturing companies in Kenya. This is shown by the regression analysis value $F(1, 242) = 41.319, p < .05, R^2 = .146$. Correlation analysis revealed that there is a significant and a moderate positive correlation between Supply Chain Collaboration (SCC) practice X1 and the performance of Steel

Manufacturing companies in Kenya ($r = 0.382$, $p < 0.01$). Also descriptive analysis revealed that majority of the respondents, 65.2% agreed that Supply Chain Collaboration Practice significantly contributes to performance of Steel Manufacturing Companies in Kenya.

The study findings echo that of Ou *et al.* (2010) arguing that a collaborative long-term relationship with suppliers facilitate in garnering positive results in an array of activities as reflected in superior product quality and agile customer service. These is also in harmony with Singh and Power (2009), who observes that organizations would enhance customer satisfaction and other positive business outcomes if they remain engaged in collaborative relationships with both customers and suppliers. (Holweg, 2005), asserts that increased collaboration will lead to a seamless, synchronized supply chain, which in turn will lead to improved customer service, lower costs and higher profits.

5.2.2 To examine the contributions of green supply chain management practice on performance of steel manufacturing Companies in Kenya

The results indicate that there is significant relationship between green supply chain management practice and the performance of Steel manufacturing companies in Kenya. This is supported by regression analysis results with $F(1, 242) = 40.516$, $p < .05$, $R^2 = .143$

Correlation analysis results also indicates that there is a significant and a moderate positive correlation between Green Supply Chain Management (GSCM) practice X_2 and the performance of Steel Manufacturing companies in Kenya ($r = 0.379$, $p < 0.01$) and from the descriptive analysis, majority of the respondents, 72.5% agreed that Green supply chain management Practice contributes to performance of Steel Manufacturing Companies in Kenya.

The findings in this research are in agreement with previous research by Jamal (2009) whose findings on showed that green supply chain practices have positive contribution to organization performance. He argued that incorporating GSCM

practices in the organizations help improve the performance. Findings are also similar to an empirical research conducted by Amemba *et al.* (2013) which established that the adoption of green manufacturing leads to enhanced production efficiency and reduced wastage leading to better performance of the organization.

5.2.3 To investigate the contributions of information Sharing practice on performance of Steel Manufacturing Companies in Kenya

The study found out that information sharing practice contributes significantly to the performance of Steel manufacturing companies in Kenya. Regression analysis results supports the finding with $F(1, 242) = 35.874, p < .05, R^2 = .129$. Correlation analysis results shows that there is a significant and a moderate positive correlation between Information Sharing (IS) practice X3 and the performance of Steel Manufacturing companies in Kenya ($r = 0.359, p < 0.01$). The findings from descriptive analysis indicates that majority of the respondents, 82.4% agreed that information sharing Practice contributes to the performance of Steel Manufacturing Companies in Kenya.

The findings concurs with previous research by Lee *et al.* (2004) which revealed that information sharing provides a unifying focus for the efforts of chain members to create better performance. Frohlich and Westbrook (2001) found out that higher degree of information sharing and close relationship with suppliers and customers can reduce manufacturing, delivery and procurement lead-times. Also Gichuru *et al.* (2015), found out that information sharing and resource sharing has positive influence in the performance of the company.

5.2.4 To find out to what extend does customer relationship management practice contributes to the performance of Steel Manufacturing Companies in Kenya

The findings of the study indicate that customer relationship management practice contributes significantly to the performance of Steel manufacturing companies in Kenya. From the descriptive analysis, majority of the respondents, 87.3% agreed that Customer relationship management practice contributes to the performance of Steel

Manufacturing Companies in Kenya. Regression analysis results supports the findings with $F(1, 242) = 69.044, p < .05, R^2 = .222$. Correlation analysis results also indicates that there is a significant and a moderate positive correlation between Customer Relationship Management (CRM) practice X4 and the performance of Steel Manufacturing companies in Kenya ($r = 0.471, p < 0.01$)

The results concurs with previous research by Thatte (2007) which revealed that Customer relationship management allow product differentiation from competitors, help sustain customer satisfaction, enhance loyalty and elevate the value the company provides to customer. The results are also supported by Bommer *et al.* (2001) who asserted that Customer relationship management being an internal component of an organization's marketing strategy assists the organization to increase performance in terms of sales and profits.

5.3 Conclusions

The study findings showed supply chain management practices that include; supply chain collaboration practice, Green supply chain management practice, Information sharing practice and Customer relationship management practice significantly contribute to performance of Steel manufacturing companies in Kenya. This is supported by regression analysis findings with $F(4, 239) = 33.895, p < .05, R^2 = .362$. The descriptive analysis further revealed that CRM Practice with ($\beta = 0.349, p < 0.05$) has the strongest relationship with the Performance of Steel manufacturing Companies in Kenya, then followed by GSCM practice ($\beta = 0.190, p < 0.05$), IS Practice ($\beta = 0.182, p < 0.05$) and finally SCC practice ($\beta = 0.145, p < 0.05$) respectively.

When the hypotheses were tested in the regression model, the independent variables were found to have a significant relationship with the performance of steel manufacturing companies in Kenya.

5.4 Recommendations

The study is a justification that the company that incorporate Supply chain management practices which include supply chain collaboration practice, Green supply chain management practice, information sharing practice and customer relationship management practice has a positive and significantly contributions on the performance of Steel manufacturing companies in Kenya.

5.4.1 Managerial recommendations

The steel manufacturing companies in Kenya should ensure the high supply chain collaboration at all levels between supplier and customer that will contribute significantly to their competitive advantage and improved performance. The company should create extensive coordination by involvement of suppliers in joint planning, involving them in product development process and having clear policy on managing the relationship. The company should standardize means of communication by creating environment that improves effective information and resource sharing among trading partners. This can only be realized when the steel manufacturing companies ensure strong relationship with suppliers based on mutual understanding and mutual goals.

Steel manufacturing companies in Kenya should adopt Green supply chain management practice by ensuring the use of inputs with relatively low environmental impacts in the production processes so that the company not only realize cost savings but also achieves highly efficient outputs with little or no wastage or pollution. The Steel Manufacturing companies should optimize their packaging processes and this will help them to minimize waste in terms of space and easy transportation. They should develop a policy on green supply Chain Management Practices to guide their suppliers and the Company on Green Supply Chain Management. The policy should clearly state when and how the environmental audit should be conducted and ensures that company's environmental standards are incorporated in their selection and evaluation criteria of their suppliers. There should be a clear system for environmental monitoring to ensure the chain members comply with specific

environmental standard or codes and they should only procure materials from environmentally certified suppliers through ISO 14000 and 14004.

Managers for Steel manufacturing companies in Kenya should encourage the information sharing with their supply chain members and this can only be realized when they accept to link the company's information systems with their clients. Through linkage of information systems, the company can share the production, delivery schedules and performance metrics of the company across the company's supply chain and they can track the order fulfillment and shipment status of the company across supply chain. This will ensure that the company gets timely, reliable quality information from supply chain members that will assist the company in quick decision making that will ensure improved visibility and an enhanced responsiveness to the customer needs.

Incorporation of customer relationship management practice such as establishing documented procedures to deal with customer complaints, offering after sales service to clients, soliciting customer inputs in product design, developing accounts for key customers, training customer and using customer satisfaction criterion to evaluate the performance of the company can significantly help in enhancing the performance of Steel manufacturing companies in Kenya. This can be achieved when the companies invest heavily in information technology customer data storage and retrieval.

5.4.2 Policy recommendations

Policies should be put in place to strengthen and increase overseas market access for Kenyan Steel products through regional and bilateral trade negotiations and creating regional integrations with African countries. In addition to that they should develop policies that enable Steel manufacturing companies to actively participate in international non-reciprocal and preferential trade arrangement which will create market for Kenyan products by creating an enabling environment through improved infrastructures such as transport, Electricity and Communication for industrial development.

Lastly, Policy makers should ensure there is a sound policy on preventing the damping of counterfeit products in Kenyan markets through facilitating the provision of internationally recognized standards, measurement and conformity assessment solutions to Steel Manufacturing companies such as ISO 9001: 2015, ISO 9001: 2008, ISO 14004 and OHSAS 18001

5.4.3 Theoretical implications

The research findings in this study revealed positive theoretical implications. After analysis, the studies done in Kenya didn't address specifically steel manufacturing companies. The variables used as supply chain management practices in Kenyan studies were different from the one used in this study. This gap in literature suggests that the research has made a significant contribution to the body of knowledge since the findings of the study will add to the theoretical literature on the supply chain management practices by the testing the proposed model to find out its future contribution on performance of steel manufacturing companies in Kenya performance.

5.5 Areas for Further Research

Future research might focus on a comparative study of the contributions of supply chain management practices that include supply chain collaboration practice, Green supply chain management practice, information sharing practice and Customer Relationship management practice to different business sectors in Kenya or to other developing country. In addition, Further research should apply longitudinal study to corroborate cross-sectional findings and examine performance prior to and after implementation of SCM practices at different time periods, providing insights into the refinement of the pertinent items since this research study was a cross-sectional one. In addition to that another research might include more respondents who are the suppliers and customers of the case company or industry in order to confirm or reject the findings of this research. This research only relied on information provided by staffs working in steel manufacturing companies in Kenya.

Another important area of future research is to include financial measure of performance. This will enable the Steel manufacturing companies in Kenya to assess the relationship between supply chain management practices and financial performance.

REFERENCES

- ACTIP, (2011). Steel production investment in East Africa: *Kenya lures Korean POSCO*. Kenya: ACTIP.
- Africainvestor, (2011). Manufacturing: *Kenya seeks partner in Steel mill venture*: Retrieved from: www.africainvestor.com/article.asp?id=8566
- Ahmed, S., & Ullah, A. (2012). Building Supply Chain Collaboration: Different Collaborative Approaches. *Integral Review – A Journal of Management*, 5(1), 8-21.
- Allen H. H. (2010). Critical factors for implementing green supply chain management practices. *Management research review*, 33(6), 853 – 857.
- Al-Odeh, M., & Smallhood, J. (2012). Sustainable Supply Chain Management: Literature Review, Trends, and Framework. *International Journal of Computational Engineering and Management*, 15(1), 85-90.
- Alreck, P.L., & Settle, R.B. (2004). *The Survey Research Handbook, (3rd Edition)* New York: McGraw-Hill.
- Amemba, C.S. (2013). Green Supply Chain best Practices in Hospitality Industry in Kenya. *Global Journal of Commerce and Management Perspective*, 2(3), 7-18.
- Amemba, C.S., Nyaboke, P, G., Osoro, A., & Mburu, N. (2013). Elements of Green Supply Chain Management. *European Journal of Business and Management*, 5(12), 51-61.
- Anbumozhi, V., & Kanda, Y. (2005). Greening the production and supply chains in Asia: Is there a role for voluntarily initiatives? *IGES Kansai Research Center Discussion Paper*, No. 6E.

- Arani, W., Mukulu, E., Waiganjo, E. & Wambua, J. (2016). Strategic Sourcing an Antecedent of supply Chain Resilience in Manufacturing firms in Kenya. *International Journal of Academic Research in Business and Social Science*, 6(10), 1-18.
- Arnheiter, E.D. & Maleyeff, J. (2005). The integration of lean management and six sigma. *The TQM Magazine*, 17(1), 5- 18.
- Babbie, E. R. (2011). *The Practice of social research*. (11th Edition.), Belmont C.A. Wadsworth
- Baran, R.J., Galka, R. & Strunk, P.D. (2008). *Principles of Customer Relationship Management*. USA: Thomson Ltd.
- Barasa. P.W. (2014). Sustainable supply chain management as a strategic tool for competitive advantage in Tea industry in Kenya. *Journal of Management and Sustainability*, 4(3), 157-164.
- Barratt, M. (2004). Understanding the meaning of Collaboration in the Supply Chain. Supply Chain Management. *An International Journal*, 9(1), 30-42.
- Barratt, M., & Oliveira, A. (2001). Supply Chain Collaboration: Exploring the Early Initiatives - Part One. *Supply Chain Practice*, 3(4), 34 - 43.
- Beatham, S., Anumba, C., & Thorpe, T. (2004). KPIs: A critical appraisal of their use in construction. Benchmarking: *An International Journal*, 11(1), 93-117.
- Bolo, A., & Wainaina, G. (2011). An empirical investigation of supply chain management Best practices in large manufacturing firms in Kenya. *Prime Journal of Business Administration and Management*, 1(2), 2-3.
- Bommer, M., O'Neil, B. & Treat, S. (2001), Strategic Assessment of the Supply Chain Interface: a Beverage Industry Case Study. *International Journal of Physical Distribution and Logistics Management*, 31(1), 11-25.

- Borac N., Milovanovic G. & Andjelkovic A, (2010). *Lean Production and Six Sigma Quality in Lean Supply Chain Management*, presented to Ministry of Science and Technological Development of the Republic of Serbia.
- Borade, A.B., & Bansod, S.V. (2007). Domain of supply chain management –A state of Art. *Journal of Technology Management and Innovation*, 2(4), 109-121.
- Brewer, P., & Speh, T. (2000). Using the balanced scorecard to measure supply chain performance. *Journal of Business Logistics*, 21(1), 75–93.
- Buttle, F. (2009). *Customer Relationship Management*, (2nd Edition). New York: Elsevier Limited
- Carver, R. H., & Nash, J. G. (2012). *Doing Data Analysis with SPSS. Version 18*. (5th Edition). Boston: Richard Stratton.
- Campion, M.A. (1993). Article review checklist: A criterion checklist for reviewing research articles in applied psychology. *Personnel Psychology*, 46, 705–18.
- Chin, O., Liu, F., Hung, Y., & Yen, D. (2010). A structural model of supply chain management on firm performance. *International Journal of Operations & Production Management*, 30(5), 526-545.
- Clark, B. (2004). Measuring Performance: The Marketing Perspective. *Journal of Business Performance Measurement. Theory and Practice*, Cambridge: Cambridge University Press.
- Coad, A., Segarra, A. & Mercedes T., (2010). Like milk or wine: Does firm performance improve with age? *Papers on Economics and evaluation*, 1006.
- Choi, Y., & Zhang, N. (2011). Assessing the sustainability performance of Chinese industrial sector. *African Journal of Business Management*, 5(13), 5261-5270.
- Chopra, S., & Meindl, P. (2015). *Supply Chain Management: Strategy, Planning, and Operation* (6th Edition.). New Jersey: Prentice Hall.

- Christopher, M. (2005). *Logistics and Supply Chain Management: Strategies for Reducing Cost and Improving Service* (3rd Edition), New Jersey: Prentice Hall.
- Christopher, M. (2000). The Agile Supply Chain: Competing in Volatile Markets. *Industrial Marketing Management*, 29(1), 37- 44.
- Christopher, M., & Gattorna, J. (2005). Supply chain cost management and value-based pricing. *Industrial Marketing Management*, 34(2), 115-121.
- Chu-Hua Kuei *et al.* (2001). The relationship between supply chain quality management practices and organizational performance. *International journal of Quality and reliability management*, 18(8), 864-872.
- Cochran, W.G. (1977). *Sampling Techniques*, (3rd Edition). New York: Wiley.
- Cooper, C. & Schindler, P. (2008). *Business Research Methods* (10th Edition), Boston: McGraw-Hill.
- Creswell, J.W. (2013). *Research design: Qualitative, Quantitative, and mixed methods Approaches*, (4th Edition.), London: Sage Publications.
- Croom, S., Romano, P., & Giannakis, M. (2000). Supply chain management: An analytical framework for critical literature review. *European Journal of Purchasing & Supply Management*, 6(1). 67-83.
- Day, G.S. (2000). Managing market relationships. *Journal of the Academy of Marketing Science*, 28(1), 24–30.
- Davis, M.M., & Heineke, J. (2005). *Operation Management: Integrating Manufacturing and Services*, (5th Edition). New York: McGraw Hill.
- Decrop, A. (2004). Trustworthiness in Qualitative Tourism Research. In. Phillimore, J. and Goodson, L. (eds.) *Qualitative Research in Tourism: Ontologies, Epistemologies and Methodologies* (p. 156-167). London: Routledge.

- Derocher, R., & Kilpatrick, J. (2000). Six supply chain lessons for the new millennium, *Supply Chain Management Review*, 3(4), 34-41.
- Dheeraj, N. & Vishal, N. (2012). An Overview of Green Supply Chain Management in India. *Research Journal of Recent Sciences*, 1(6), 77-82.
- Dillman, D.A. (2000). *Mail and Internet Surveys: The Tailored Design Method*. New York: Wiley.
- Doyle, P., & Stern, P. (2006). *Marketing Management and Strategy*, (4th Edition) New Jersey: Prentice Hall
- Fawcett, S.E., Ellram, L.M. & Ogden, J.A. (2007). *Supply Chain Management: From Vision to Implementation*. Upper Saddle River, NJ: Pearson Prentice-Hall.
- Fowler, F. J. (2009). *Survey research methods*, (4th Edition), Thousand Oaks, CA: Sage.
- Foya, H.A. (2015). *Effect of technology based customer relationship management on service quality in the telecommunications industry in Arusha, Tanzania*. Unpublished M.Sc. Thesis. Nairobi: Kenyatta University.
- Frankel, R., Gold, T.J. & Whipple, J.M. (2002). Grocery industry collaboration in the wake of ECR, *International Journal of Logistics Management*, 13(1), 1-16.
- Frohlich, M.T. & Westbrook, R. (2001). Arcs of Integration: An International Study of Supply Chain Strategies. *Journal of Operations Management*, 19(2), 185-200.
- George, D., & Mallery, P. (2011). *SPSS for Windows step by step: A simple guide and reference. 18.0 update* (11th Edition.), Boston: Pearson Learning.
- Gichuru, M., Iravo, M., & Arani, W. (2015). Collaborative Supply Chain Practices on Performance of Food and Beverages Companies: A Case Study of Del Monte

Kenya Ltd. *International Journal of Academic Research in Business and Social Sciences*, 5(11), 17-31.

Goodwin; Graebe., & Salgado (2000). *Supply Chain Management: A brief Introduction*. United Kingdom: Prentice Hall

Green, S.B., & Salkind, N.J. (2010). *Using SPSS for Windows and Macintosh: Analyzing and Understanding Data (6th Edition)*. Upper Saddle River, NJ: Prentice Hall.

Gunasekaran, A., Patel, C., & McGaughey, R.E. (2004). A framework for supply chain performance measurement. *International Journal of Production Economics*, 87(3), 333-347.

Gupta, R. (2013). Workforce diversity and organizational performance. *International Journal of Business and Management Invention*, 2(6), 36-41.

Gustav, T., & Mankowitz, J. (2008). *Supply Chain Management in the Swedish Steel Industry*: KTH Industrial Production, SE-100 44, Stockholm.

Gwavuya, F. (2011). Leadership Influences on Turnover Intentions of Academic Staff in Institutions in Zimbabwe. *Academic Leadership Journal*, 9(1), 1-15.

Hall, J. (2003). *Environmental supply chain innovation*. Greening of the Supply Chain, Greenleaf.

Handfield, R. B., & Nichols, E. (2003). *Introduction to Supply Chain Management*. New Jersey: Prentice Hall.

Handfield, R.B., Sroufe, R., & Walton, S.V. (2005). Integrating environmental management and supply chain strategies. *Business Strategy and the Environment*, 14(1), 1-19.

- Harrison, A. & Van Hork, R. (2011). *Logistics Management and Strategy: Competing through the Supply Chain*, (4th Edition) New Jersey: Prentice - Hall.
- Hayes, R., Pisano, G., Upton, D. & Wheelwright, S. (2005). *Operations, Strategy and Technology: Pursuing the Competitive Edge*, New York: John Wiley.
- Ho, D., Au, K., & Newton, E. (2002) Empirical research on supply chain: management: A critical review and recommendations. *International Journal of Production Research*, 40(17), 4415–4430.
- Holweg, M. (2007). The genealogy of lean production. *Journal of Operations Management*, 25(2), 420-437.
- Holweg, M. (2005). The three dimensions of responsiveness. *International Journal of Operations & Production Management*, 25(7), 603–622.
- Hsu, C. and Hu, A. (2008). Green supply chain management in the electronic industry. *International Journal of Environmental Science & Technology*, 5(2), 205-216.
- Ibrahim, B.S., & Hamid, A.A. (2012). Supply Chain Management Practices and supply chain performance effectiveness. *International Journal of Science and Research*, 3(8), 187-195.
- Jabareen, Y. (2009). Building a conceptual Framework: Philosophy, Definitions and Procedure. *International Journal of Qualitative Methods*, 8(4), 49-62.
- Jamal, F. (2009). Green Supply Chain Management: A Literature Review. *Otago Management Graduate Review*, 7(1), 51-62.
- Jap, S. D. (2001). Perspectives on joint competitive advantages in buyer-supplier relationships. *International Journal of Research in Marketing*, 18(2), 19-35.

- Jemutai, K.G. (2014). *Green supply chain management practices and performance of firms in automotive industry in Nairobi, Kenya. Unpublished M.BA. Project.* Nairobi: University of Nairobi.
- Kagira, E. K., Kimani, S. W., & Githii, S. K. (2012). Sustainable Methods of Addressing Challenges Facing Small Holder Tea Sector in Kenya: A Supply Chain Management Approach. *Journal of Enterprising Culture*, 4(4), 351-361.
- Kenya Association of Manufacturers. (2012). *The KAM industrial Business Agenda: Proposals for the Incoming Government for the Delivery of Competitive Manufacturing in Kenya Post*
- Kenya Association of Manufacturers (2006). *A Survey of Kenya's Manufacturing Sector.* Nairobi: Kenya , Association of Manufacturers.
- Kenya Engineer. (2012, *January–February*). Investors to set up Sh1.3bn steel mill: *Kenya Engineer*, 33(1), 8.
- Kenya vision, 2030. (2007). *Kenya Vision 2030: A Globally Competitive and Prosperous Kenya.* Nairobi: Government printer..
- Kimani, C. W. (2013). Supply Chain Management Challenges in Kenya Petroleum Industry: Case of National Oil Corporation of Kenya, *International Journal of Social Sciences and Entrepreneurship*, 1(3), 231-246.
- Kim, S. W. (2006). Effects of Supply Chain Management Practices, Integration, and Competition Capability on Performance, Supply Chain Management: *An International Journal*, 11(3), 241 – 248.
- Kim, S.W., & Narasimhan, R. (2002). Information system utilization in supply chain integration efforts. *International Journal of Production Research*, 40(18), 4585 - 4609.

- Kombo, D.K., & Tromp, D.L. (2011). *Proposal and Thesis writing: An introduction*. Nairobi: Pauline's publications Africa.
- Kothari, C.R. (2012). *Research Methodology Methods and Techniques*. New Delhi: Age International Publishers.
- Kotler, P., Armstrong, G., Saunders, J., & Wong, V. (2008). *Principles of Marketing*, (5th Edition), Melbourne: Person Education.
- Krajewski, L.J., Ritzman, L.P., & Malhotra, M.K. (2009). *Operations Management*, (9th Edition). New Jersey: Prentice Hall.
- Kwon, I.G., & Suh, T. (2005). Trust, commitment and relationships in supply chain management: A path analysis. *International Journal of Supply Chain Management*, 10(1), 26-33.
- Kwon, I.G., & Suh, T. (2004). Factors affecting the level of trust and commitment in supply chain relationships. *Journal of Supply Chain Management*, 40(2), 4-14.
- Lambert, D. M. (2008). *Supply Chain Management: Processes, Partnerships, Performance*. Sarasota, FL: Supply Chain Management Institute
- Lambert, D.M. (2004). The eight essential supply chain management processes. *Supply Chain Management Review*, 8(6), 18 - 26.
- Lambert, D.M., & Cooper, M.C. (2000). Issues in Supply Chain Management, *Industrial Marketing management*, 29(1), 65-83.
- Lau, H. C. W., & Lee, W. B. (2000). On A Responsive Supply Chain Information System, *International Journal of Physical Distribution & Logistics Management*, 30(7), 598-611.

- Lebans, M., Euske, K. (2006). A conceptual and operational delineation of performance, *Business Performance Measurement*, New York: Cambridge University Press
- Lee, H. L. (2004). The Triple-A Supply Chain: *Harvard Business Review*, 82(10), 102-113.
- Lee, H. L., Padmanabhan, V. & Whang, S. (2004). Information Distortion in a Supply Chain: The Bullwhip Effect, *Management Science*, 50(12), 1875-1886.
- Lee, H.L., & Whang, S. (2001). E- Business and Supply Chain Integration: *Stanford Global Supply Chain Management Forum*, p. 223-241
- Li, S., Ragu-Nathan, B., Ragu-Nathan, T., & Subba R, S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega: International Journal of Management Science*, 34(2), 107–124.
- Lind, D.A., Marchel, W.G. & Wathen, S. (2011). *Statistical Techniques in Business and Economics* (15th Edition).New York: Mc Graw-Hill.
- Lockamy, A., & McCormack, K. (2004). Linking SCOR planning practices to supply chain performance. *International Journal of Operations & Business Management*, 24 (12), 1192-1218.
- Lummus, R. R., Duclos, L. K., & Vokurka, R. J. (2003). Supply Chain Flexibility: Building a New Model. *Global Journal of Flexible Systems Management*, 4(4), 1-13.
- Lysons, K., & Farrington, B. (2012). *Purchasing and Supply Chain Management*, (8th Edition). Pearson Harlow: CIPS Textbook.

- Manrodt, K.B., Abott, J., & Vitasek, K. (2008). *Lean practices in the supply chain. Report on Lean Practices in the Supply Chain*, APICS. Retrieved from www.apics.org.
- Martin, J.H., & Grbac, B. (2003). Using supply chain management to leverage a firm's market orientation. *Industrial Marketing Management*, 32(1), 25-38.
- Matos, S., & Hall, J. (2007). Integrating sustainable development in the supply chain: The case of life cycle assessment in oil and gas and agricultural biotechnology. *Journal of Operations Management*, 25(6), 1083-1102.
- Mentzer, J.T. (2004). *Fundamentals of Supply Chain Management: Twelve Drivers for Competitive Advantage*. Thousand Oaks, CA: Sage Publications, Inc.
- Moberg, C.R., Cutler, B.D., Gross, A., & Speh, T.W. (2002). Identifying antecedents of information exchange within supply chains. *International Journal for Physical Distribution Logistics*, 32(9) 755-770.
- Mohammad Ali, Isabel, Metz, & Kulik, C.T. (2007). Workforce gender diversity: Is it a source of competitive advantage?. *21st ANZAM conference*, Sydney, Australia.
- Mugenda, O.M., & Mugenda A.G. (2008). *Research Methods: Quantitative and Qualitative Approaches*. Nairobi: Acts press.
- Musuya, A. B. & Namusonge, G. S. (2013, 12th -13th September). Medical products demand and supply stability as a factor influencing implementation of just in time supply chain management policies: A case study of the ministry of public health and sanitation in Kenya: *Proceedings of 1st JKUAT-SHRD Research Conference*.
- Mutuerandu, N.M., & Iravo, M. (2014). Impact of Supply Chain Management practices on organizational performance: A case study of Haco Industries Limited (Kenya). *IOSR Journal of Business and Management*, 16(4), 62-64.

- Nachmias, C., & Nachmias, D. (2008). *Research Methods in Social Sciences*, (7th Edition), New York: Worth Publishers.
- Namusonge, G. S. (2010). *Business Statistics: Concepts and Applications*. Beau Bassin, Mauritius: VDM Publishing House Ltd.
- Namasange, J.O. & Biraori, E.O. (2015). Effect of supplier relationship management on the effectiveness of supply chain management in the Kenya public sector. *International Journal of Managing Value and Supply Chains*, 6(1), 25-32.
- Narasimhan, R., Jayaram, J., & Carter, J.R. (2001). An empirical examination of the underlying dimensions of purchasing competence. *Production and Operations Management*, 10(1), 1-15.
- Näslund, D., & Williamson, S. (2010). What is Management in Supply Chain Management? - A Critical Review of Definitions, Frameworks and Terminology. *Journal of management Policy and Practice*, 11(4), 11-27.
- National Planning Commission. (2011). *National Development Plan: Kenya Vision 2030*. Nairobi: NPC.
- Naylor, B. J., Naim, M.M., & Berry, D. (1999). Leagility: Integrating the lean and agile manufacturing paradigms in the total supply chain. *International Journal of Production Economics*, 62(1), 107-118.
- Neely, A. (2005). The evolution of performance measurement research, *International Journal of Operations & Production Management*, 25(12), 1264-1279.
- Nimawat, D., & Namdev, V.(2012). An Overview of green Supply Chain Management in India, *Research Journal of Recent Sciences*, 1(6), 77-82.
- Ninlawan, C., Seksan, P., Tossapol K. & Pilada, W. (2010, March 17 – 19). The implementation of green supply chain management practices in electronics industry. *Proceedings of the International Multi Conference of Engineers and Computer Scientists, Hong Kong*.

- Nunnally, J. C., & Bernstein, I.H. (2001). *Psychometric Theory* (3rd Edition). New York: McGraw Hill.
- Norusis, M.J. (2009). *PASW statistics 18 statistical procedures companion*. Upper Saddle River, NJ: Prentice Hall.
- Nteete, K., Namusonge, G. S., & Mukulu, E. (2012). Pedagogical Approaches Determining the Performance of Entrepreneurship Education in Kenya Public Universities, *International Journal of Humanities and Social Science*, 2(13), 1-13.
- Odhiambo, A. (2011). *Kenya seeks partner in steel mill venture: Africa Investor*, Retrieved from: <http://www.africainvestor.com/article.asp>
- Okanda, O., Namusonge, G.S., & Waiganjo, E.(2016).Influence of Supply Planning Practice on the Performance of the Unit of Vaccines and Immunizations in the Ministry Health, Kenya. *International Journal of Healthcare Sciences*, 4(1), 276-286.
- Okello, J. O., & Were, S. (2014). Influence of supply chain management practices on performance of the Nairobi Securities Exchange's listed, food manufacturing companies in Nairobi. *International Journal of Social Sciences and Entrepreneurship*, 1(11), 107-128.
- Okemba, P.O., & Namusonge, S.G. (2014). Green supply chain management practices as determinants of supply chain performance in Kenya's manufacturing firms: A case study of Nairobi-based firms in the food and beverage sector. *The Strategic Journal of Business & Change Management*, 2(22), 423-431.
- Orodho, A. J. (2009). *Essentials of Educational and Social Sciences Research Method*, Nairobi: Masola Publishers.

- Osoro, A., Muturi, W.M., & Ngugi, P.K. (2015). Determinant Affecting Performance of Supply Chain Systems in the Petroleum Industries in Kenya. *International Journal of Scientific and Research Publications*, 5(10), 1-11.
- Ott, L., & Longnecker, M. (2010). *An introduction to statistical methods and data analysis*, (6th Edition), Australia; Pacific Grove, CA: Thomson Learning
- Ou, C. S., Liu, F. C., Hung, Y. C. and Yen, D. C. (2010). A Structural Model of supply chain management on firm performance. *International Journal of Operations & Production Management*, 30(5), 526-545.
- Pagell, M. (2004). Understanding the factors that enable and inhibit the integration of Operations, Purchasing and Logistics. *Journal of Operations Management*, 22(5), 459–487.
- Panayides, P.M., & Venus Lue, Y.H. (2009). The Impact of trust on innovativeness and supply chain performance. *International Journal of Production Economics*, 122(1), 35-46.
- Parvatiyar, A. & Jagdish, N. S. (2001). Customer Relationship Management: Emerging Practice, Process, and Discipline. *Journal of Economic and Social Research*, 3(2), 1-34.
- Patton, M.Q. (2002). *Qualitative Research and Evaluation Methods*. Thousand Oaks, California: Sage Publication
- Porter, M. (2008). The five competitive forces that shape strategy, *Harvard Business Review*, 86(1) 78-93
- Porter, M.E. (1985). *Competitive advantage: creating and sustaining superior performance*, New York: The Free Press.
- Power, D. (2005). Supply chain management integration and implementation: A literature review. *Supply Chain Management*, 10(3), 252–263.

- Praxiom Research Group Limited (2010). *Definition of quality*: Retrieved from: <http://www.praxiom.com/iso-definition.htm>
- Premkumar, G., Ramamurthy, K., & Saunders, C. (2003). Information processing view of organizations: An exploratory examination of fit in the context of inter-organizational relationships. *Journal of Management Information Systems*, 22(1), 257–294.
- Rajagopal & Sanchez, R. (2005). Analysis of customer portfolio and relationship management models: bridging managerial dimensions, *Journal of Business & Industrial Marketing*, 20(6), 307 – 316.
- Rao, S. S. (2002). Making enterprises Internet ready: *E-business for process Industries: Work Study*, 51(4), 248-253.
- Ryu, I., SoonHu, S., & Koo, C. (2009). The role of partnership in supply chain performance. *Industrial Management & Data Systems*, 109(4), 496-514.
- Saad, M., Jones, M., & James, P. (2002). A review of the progress towards the adoption of supply chain management relationships in construction. *European Journal of Purchasing & Supply Management*, 8(3),173-183.
- Sakka, S. (2013). The Impact of applying Quality Management System and environmental Standard on organization performance an Application of SME's in Egypt. *European Journal of Business Management*,5(19), 82-86.
- Salam, M.A. (2008, December 3-5). Green procurement adoption in manufacturing supply chain: *Proceedings of the 9th Asia Pacific Industrial Engineering & Management Systems Conference (APIEMS2008)*. Indonesia, pp.1253-1260.
- Sandberg, E. (2007). Logistics collaboration in the supply chains: Practice vs. Theory. *International Journal of Logistics Management*, 18(2), 274-293.

- Sanner, L., Wijkman, P.M. (2005). Benchmarking business practices in Swedish manufacturing firms, *Working Paper No. 3*
- Sari, U. (2009). *Framework for Analysis and Developing Information Integration. A study on Steel industry maintenance service supply chain*. OuLu: University of Oulu.
- Saunders, M., Lewis, P. & Thornhill, A. (2009). *Research Methods for Business Students* (5th Edition). New Jersey: Prentice -Hall.
- Sawilowsky, S. (2002). Fermat, Schubert, Einstein, and Behrens-Fisher: The Probable Difference between Two Means When $\sigma_1^2 \neq \sigma_2^2$. *Journal of Modern Applied Statistical Methods*, 1(2), 461–472.
- Sekaran, U. & Bougie, R. (2010). *Research Methods for Business: A skill Building Approach*. (5th Edition). New Jersey: John Wiley and Sons.
- Shah, J. (2009). *Supply Chain Management: Text and Cases*. New Delhi, India: Pearson Education
- Sahay, B. S. & Maini, A. (2002). Supply chain: A shift from transactional to collaborative partnership, *Decision*, 29(2), 67-88.
- Shapiro, J.F. (2001). *Modeling the Supply Chain*. Duxbury, Pacific Grove, California.
- Sharma, M.K., & Bhagwat, R. (2006). Practice of information systems: Evidence from select Indian SMEs. *Journal of Manufacturing Technology*, 17(2), 199-223.
- Simatupang, T. M., & Sridharan, R. (2005). The collaboration index: A measure for supply chain collaboration. *International Journal of Physical Distribution & Logistics Management*, 35(1), 44-62.

- Simatupang, T. M. & Sridharan, R. (2002). The Collaborative Supply Chain. *International Journal of Logistics Management*, 13(1), 15-30.
- Simchi-Levi, D., Kaminsky, P., & Simchi-Levi, E. (2009). *Designing and Managing the Supply Chain: Concepts, Strategies and Case Studies* (3rd edition). New York: McGraw-Hill.
- Simiyu, A. N. (2012). *Performance Contract as a Tool for Improving Performance in Local Authorities in Kenya*. Unpublished PhD Thesis. Juja: Jomo Kenyatta University of Agriculture and Technology.
- Singh, P.F., & Power, D. (2009). The nature and effectiveness of collaboration between firms, their customers and suppliers: A supply chain perspective. *Supply Chain Management: An International Journal*, 14(3), 189-200.
- Skjøtt-Larsen, T., Schary, P., Mikkola, J.H. & Kotzab, H. (2007). *Managing the Global Supply Chain*. (3rd Edition), Copenhagen: Copenhagen Business School Press.
- Srivastava, S.K. (2007). Green supply-chain management: A state-of-the-art literature review, *International Journal of Management Reviews*, 9(1), 53–80.
- Stadtler, H., & Kilger, C. (2008). *Supply Chain Management and Advanced Planning: Concepts, Models, Software and Case Studies*, (4th Edition). Berlin: Springer.
- Stank, T. P., Keller, S.B., & Daugherty, P.J. (2001). Supply Chain Collaboration and Logistical service performance. *Journal of Business Logistics*, 22(1), 29-48.
- Standard & Poor's (2007). *Industry Survey – Metals: Industrial*; Retrieved from: <http://sandp.ecnext.com/coms2>
- Stenbacka, C. (2001). Qualitative research requires quality concepts of its own: *Management Decision*, 39(7), 551-555.

- Stonebraker, P., & Liao, J. (2004) Environmental turbulence, strategic orientation: Modeling supply chain integration. *International Journal of Operations & Production Management*, 24(10), 1037–1054.
- Storey, R., Emberson, C., Godsell, J., & Harrison, A. (2006). Supply Chain Management: Theory, Practice and future challenges. *International Journal of Operations and Production Management*, 26(7), 754-774.
- Suhong, Li, Bhanu Ragu-Nathan, T.S.Ragu-Nathan., & S. Subba Rao, (2006). *The Impact of Supply Shain Management Practices on Competitive Advantage and Organizational Performance*, Omega, 34(2), 107-124.
- Sukati, I., Hamid, A.B., Baharun, R., Tat, H.H., & Said, F. (2011). An investigation of the relationship between Supply Chain Management Practices and Competitive advantage of the firm: *Contemporary Marketing Review*, 1(4), 1-13.
- Sundarraaj, R.P., & Talluri, S. (2003). A multi-period optimization model for the procurement of component-based enterprise information technologies. *European Journal of Operations Research*, 146(2), 339 – 351.
- Tan, K. C., Lyman, S. B., & Wisner, J. D. (2002). Supply chain management: A strategic perspective. *International Journal of Operations and Production Management*, 22(6), 614– 631.
- Tan, X. C., Liu, F., Cao, H. J., & Zhang, H. (2002). A decision making framework model of cutting fluids election for green manufacturing and a case study. *J. Mater. Process. Tech*, 129(1), 467–470.
- Tavakol, M., & Dennick, R. (2011). Making sense of Cronbach’s alpha. *International Journal of Medical Education*, 2, 53-55.

- Thatte, A.A. (2007). *Competitive advantage of a Firm through Supply Chain Responsiveness and Supply Chain Management Practices*. Published PhD Dissertation. Toledo: University of Toledo.
- Toyin, I.A. (2012). Supply Chain Management Practices in Nigeria Today: Impact on SCM Performance. *European Journal of Business and Social Sciences*, 1(6), 107 – 115.
- Trochin, W. (2004). *Research Methods Knowledge Base*. Ithaca: Cornell University
- UNIDO (2006) *Product quality: A guide for small and Medium-sized enterprises; Working paper*
- Van Hock, R., & Erasmus, I. (2000). From reversed logistics to green supply chains. *Logistics Solutions*, 4(3), 28-33.
- Vokurka, R. J., & Lummus, R. R. (2000). The role of just-in-time in supply chain Management. *International Journal of Logistics Management*, 11(1), 89-98.
- Whipple, J. M., & Russell, D. (2007). Building supply chain collaboration: A typology of collaborative approaches. *International Journal of Logistics Management*, 18(2), 174- 196.
- Wisner, G. (2007). *The postgraduate Research Handbook: Succeed with MA, MPhil, EdD and PhD (2nd Edition)*, London: Palgrave-Macmillan Ltd.
- Wisner, J.D., Leong, G.K., & Tan, K.C. (2010). *Principles of Supply Chain Management – A Balanced Approach (3rd Edition)*. USA: Thomson: South-Western Publishing.
- Womack, J. P. & Jones D. T. (2003). *Lean thinking*, (2nd Edition) London: Free Press Business
- Yin, R.K. (2013). *Case study research design and methods: Applied social research methods series*, (5th Edition). New York: Sage Publications, Inc.

- Young, N. (2009). Understanding the Research Process and Methods. *An Introduction to Research Methods*. Las Vegas: Acts Press.
- Yu, Z., Yan, H., Cheng, T.C. (2001). Benefits of information sharing with supply chain partnerships. *Industrial Management & Data Systems*, 101(3), 114-119.
- Yusuf, Y.Y., Gunasekaran, A., Adeleye, E.O. & Sivayoganathan, K. (2004). Agile Supply Chain Capabilities: Determinants of Competitive Objectives, *European Journal Of operational Research*, 159(2), 379-392.
- Zavareh, J.T. (2008). *The Role of Analytical CRM in Maximizing Customer Profitability in Private Banking – The case of two Swedish Banks*. Unpublished PhD Thesis. Lulea Sweden: Lulea University of Technology.
- Zhang, J. & Zheng, L. (2010, October 8-10th). Research on the Building of Green Logistics System and the Development Strategy in Jilin Province. *International Conference, Logistics engineering and management*: American Society of Civil Engineers, Chengdu, China
- Zhu Q., Sarkis, J., & Geng, Y. (2005). Green supply chain management in China: Pressures, Practices and performance. *International Journal of Operations & Production Management*, 25(5), 449- 468.
- Zhu, Q., Sarkis, J., & Lai, K. (2013). Institutional-based antecedents and performance outcomes of internal and external green supply chain management practices. *Journal of Purchasing and Supply Management*, 19 (2), 106–117.
- Zikmund, W. & Babin, J. (2007). *Exploring Marketing Research* (9th Edition.): USA: Thompson-South Western.

APPENDICES

APPENDIX I: QUESTIONNAIRE

The purpose of this questionnaire is to establish *the contributions of the supply chain management practices on performance of steel manufacturing companies in Kenya*. Kenya has great potential to become the leading country in the manufacturing and export of steel product in the world. However, this cannot be realized if the companies are not able to explore the full potential by integrating the supply chain management practices in their business operations. The results of this study will be used to make recommendations to the Kenya Government and steel manufacturing companies in order to improve their supply chain processes to make Kenyan steel products more competitive in the global market.

Please TICK the box that best describe your feelings about the statements using the codes provided, where applicable.

SECTION A

Personal Data

1. Please Tick [] your age bracket

| 20-30yrs | 31-40yrs | 41-50yrs | 51-60 yrs | 61-70yrs | Above 70yrs |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

2. Gender: Female

Male

3. Designation: -----

4. Name of the Company:-----

5. Did the company relocate from another country?

| | |
|-----|----|
| YES | NO |
| | |

If yes, name the country of origin. -----

6. The company's annual turnover? (Tick appropriately)

| | | | |
|-----------------------|---------------|--------------|------------------|
| Less than 1.0 Billion | 1.0-5 Billion | 5-10 Billion | Above 10 Billion |
| | | | |

7. Number of years the company has been in operation in Kenya

| | | | | | |
|---------|----------|----------|----------|-----------|-------------|
| 1-10yrs | 11-20yrs | 21-30yrs | 31-40yrs | 41-50 yrs | Above 50yrs |
| | | | | | |

8. Has the company incorporated supply chain management practices in its management practices?

| | |
|-----|----|
| YES | NO |
| | |

If yes, which of the following supply chain management practices have been incorporated in your supply chain management practices?

| Supply Chain Management Practices | Tick |
|---|-------------|
| Supply chain collaboration practice | |
| Green Supply chain Management Practice | |
| Information Sharing Practice | |
| Customer relationship management practice | |
| Others (Specify) | |

9. The following are supply chain management practices. For each of the practice, please tick appropriately

a. Supply Chain Collaboration Practice

i. The following statements deal with supply chain collaboration in your company. Please Tick (√) only on one number that best reflects your opinion on the following five point scale: {1 = Strongly Disagree (SD), 2 = Disagree (D), 3 =Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA)}

| | Supply Chain collaboration practice | SD | D | N | A | SA |
|---|---|-----------|----------|----------|----------|-----------|
| 1 | My company involves our suppliers in the joint planning and forecasting process | | | | | |
| 2 | My company relationship with its suppliers is based on mutual understanding and mutual goals | | | | | |
| 3 | My company has a clear policy on managing the relationship with suppliers | | | | | |
| 4 | My company has developed the system to monitor the supplier performance | | | | | |
| 5 | There is clear coordination and resource sharing between my company and our supplier | | | | | |
| 6 | There is standardized means of communication across all functions in my company and our suppliers | | | | | |

ii. In your opinion do you think Supply Chain Collaboration Practice contributes to performance of your company? Yes No

iii. Kindly rate your Company's implementation of Supply Chain Collaboration Practice by ticking from the scale provided where 1=Terrible, 2=Poor, 3 =Fair, 4= Good and 5= Excellent 1 2 3 4 5

b. Green Supply Chain Management Practice

- i. The following statements deal with Green supply chain management practice in your company. Please Tick (√) only on one number that best reflects your opinion on the following five point scale: {1 = Strongly Disagree (SD), 2 = Disagree (D), 3 =Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA)}

| | Green Supply Chain Management Practice | SD | D | N | A | SA |
|---|---|-----------|----------|----------|----------|-----------|
| 1 | My company has developed policy on green supply chain management practices to guide suppliers and the company on GSCM | | | | | |
| 2 | My company optimize the packaging processes to reduce cost | | | | | |
| 3 | My company conducts periodically environmental Audit | | | | | |

- ii. In your opinion do you think Green Supply Chain Management Practice contributes to performance of your company? Yes No

- iii. Kindly rate your Company's implementation of Green Supply Chain Management Practice by ticking from the scale provided where 1=Terrible, 2=Poor, 3 =Fair, 4= Good and 5= Excellent 1 2 3 4 5

c. Information Sharing Practice

- i. The following statements deal with Information sharing practice in your company. Please Tick (✓) only on one number that best reflects your opinion on the following five point scale: { 1 = Strongly Disagree (SD), 2 = Disagree (D), 3 =Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA)}

| | Information Sharing Practice | SD | D | N | A | SA |
|---|---|-----------|----------|----------|----------|-----------|
| 1 | My company has developed the policy to guide on the information sharing within and outside our organization | | | | | |
| 2 | My company has fully invested in state of art information system to enable information sharing within and outside our company | | | | | |
| 3 | Production and delivery schedules of our company are shared across our supply chain | | | | | |
| 4 | Performance metrics of our company are shared across our company's supply chain | | | | | |
| 5 | Order fulfillment and shipment status of our company are tracked at each step across the supply chain | | | | | |
| 6 | Our company information systems are integrated with our key clients | | | | | |

- ii. In your opinion do you think Information Sharing Practice contributes to performance of your company? Yes No

- iii. Kindly rate your Company's implementation of Information Sharing Practice by ticking from the scale provided where 1=Terrible, 2=Poor, 3 =Fair, 4= Good and 5= Excellent 1 2 3 4 5

d. Customer Relationship Management Practice

i. The following statements deal with customer relationship management practice in your company. Please Tick (√) only on one number that best reflects your opinion on the following five point scale: {1 = Strongly Disagree (SD), 2 = Disagree (D), 3 =Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA)}

| | Customer relationship management practice | SD | D | N | A | SA |
|---|--|-----------|----------|----------|----------|-----------|
| 1 | My company has documented procedures to deal with customer complaints | | | | | |
| 2 | My company offer after sales service to their clients | | | | | |
| 3 | My company solicits customers' inputs in our products design | | | | | |
| 4 | My company conduct training to our customers | | | | | |
| 5 | My company has developed accounts for our key customers | | | | | |
| 6 | Customer satisfaction criterion is used to evaluate the performance of our company | | | | | |

ii. In your opinion do you think Customer Relationship Management Practice contributes to performance of your company? Yes No

iii. Kindly rate your Company's implementation of Customer Relationship Management Practice by ticking from the scale provided where 1=Terrible, 2=Poor, 3 =Fair, 4= Good and 5= Excellent 1 2 3 4 5

10. **Steel Manufacturing Company's Performance**

The following statements deal with performance in your company. Please Tick (√) only on one number that best reflects your opinion on the following five point scale: {1 = Strongly Disagree (SD), 2 = Disagree (D), 3 =Neutral (N), 4 = Agree (A), 5 = Strongly Agree (SA)}

Performance in terms of customer satisfaction

| | Customer Satisfaction | SD | D | N | A | SA |
|---|--|-----------|----------|----------|----------|-----------|
| 1 | Customer retention rate of my company has gone up | | | | | |
| 2 | Customer acquisition rate of my company has improved | | | | | |
| 3 | There has been increased number of referral for our company's products | | | | | |

i. In your own opinion, does your company offer Customer Satisfaction?

Yes No

ii. Kindly rate your Company's performance in terms of customer satisfaction by ticking from the scale provided where 1=Terrible, 2=Poor, 3 =Fair, 4= Good and 5= Excellent

1 2 3 4 5

Performance in terms of Product Quality

| | Product Quality | SD | D | N | A | SA |
|---|---|-----------|----------|----------|----------|-----------|
| 1 | Number of failures or reject rates have reduced in my company | | | | | |
| 2 | Number of product returned by our clients have reduced | | | | | |
| 3 | Number of customer complaints have gone down in our company | | | | | |

i. In your own opinion, do you think your company offers Quality products to its clients?

Yes No

ii. Kindly rate your Company's performance in terms of Product quality by ticking from the scale provided where 1=Terrible, 2=Poor, 3 =Fair, 4= Good and 5= Excellent 1 2 3 4 5

Overall Performance of steel manufacturing companies

11. Kindly rate your Company's overall performance by ticking from the scale provided where 1=Terrible, 2=Poor, 3 =Fair, 4= Good and 5= Excellent 1 2 3 4 5

END OF QUESTIONNAIRE

Thank you God Bless You

APPENDIX 1I: LETTER OF INTRODUCTION TO THE RESPONDENTS

*Peter Wamalwa Barasa
P.O Box 10392,
Mombasa
Tel: 0721203761*

Date: 17th November 2014

Dear Sir/Madam,

REF: REQUEST TO PARTICIPATE IN MY PHD RESEARCH

My names are Peter Wamalwa Barasa. I am a PhD student at Jomo Kenyatta University of Agriculture and Technology conducting research on the *Contributions of Supply Chain Management Practices on performance of Steel manufacturing companies in Kenya*. I would like to kindly request you to participate in my research. The research will be conducted through a questionnaire and an interview process. The interview is estimated to take thirty minutes. I am therefore kindly asking you to spare some time out of your busy schedule to fill the questionnaire provided and for the interviews (*Procurement manager*). The information obtained will be treated with utmost confidentiality while results will be used for academic purpose only. Upon request, the findings of the research will be availed to you.

Thanking you in advance for your co-operation.

Yours Sincerely

Peter Wamalwa Barasa
PhD Student- JKUAT, Kenya

APPENDIX III: INTRODUCTION LETTER FROM UNIVERSITY



**JOMO KENYATTA UNIVERSITY
OF
AGRICULTURE AND TECHNOLOGY
JKUAT MOMBASA CAMPUS**

Telegrams "Thika"
Tel: 041 2006404, (067) 52259
Email: jkuatmombasa@jkuat.ac.ke
REF. JKU/MSA/ACA/07/08

OFFICE OF THE DIRECTOR
MOMBASA CAMPUS
P. O. BOX 81310-80100
MOMBASA

07/06/2014


TO WHOM IT MAY CONCERN

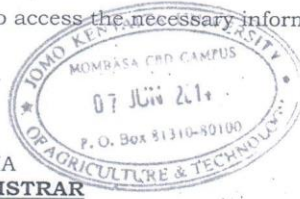
RE: BARASA PETER WAMALWA REG. NO. HD433-C005-2810/2011

SUBJECT: COLLECTION OF DATA

The above named is a bonafide student of Doctor of Philosophy in Business Administration (Procurement and Supply Chain Management Option) in this campus. He is now collecting data in the research based on *Contributions of Supply Chain Management Practices on the Performance of Steel Manufacturing Companies in Kenya*.

Kindly allow him to access the necessary information as requested.


**AGGREY WANYAMA
AG. DEPUTY REGISTRAR**



JKUAT IS ISO 9001:2008 Certified
Setting Trends in Higher Education, Research and Innovations

APPENDIX IV: RESEARCH PERMIT FROM NASCOSTI

THIS IS TO CERTIFY THAT:
MR. PETER WAMALWA BARASA
of JOMO KENYATTA UNIVERSITY OF
AGRICULTURE AND TECHNOLOGY,
0-80100 MOMBASA, has been permitted
to conduct research in All Counties

on the topic: CONTRIBUTIONS OF
SUPPLY CHAIN MANAGEMENT
PRACTICES ON THE PERFORMANCE OF
STEEL MANUFACTURING COMPANIES IN
KENYA

for the period ending:
31st March, 2015

Permit No : NACOSTI/P/14/9187/4180
Date Of Issue : 15th December, 2014
Fee Received :Ksh 2,000

Applicant's Signature

Secretary
National Commission for Science, Technology & Innovation

**APPENDIX V: LIST OF STEEL MANUFACTURING COMPANIES IN
KENYA**

| S/No | COMPANY | ADDRESS (HEADQUARTERS) |
|-------------|-----------------------------------|--|
| 1 | Brollo Kenya Ltd | Box 90651-80100 Mombasa-Miritini, Tel: +254(41)2312123/4/5 Email: info@brollokenya.com |
| 2 | Kenya United Steel Co. Ltd | Box 90550, Mombasa, Miritini |
| 3 | Steel Makers Ltd (SML) | Mazeras, Mombasa-Nairobi Highway Rd, KENYA Tel.: (+254 41) 2229221, 2229163, E-mail: nbo@steelmakers.com website: www.steelmakers.com |
| 4 | Venus Metal (Africa) Ltd | Box 46893 Nairobi, Industrial Area, Homabay road |
| 5 | RLCO Steel Fabricator (Kenya) Ltd | Box 32138 Nairobi, Lunga Lunga road Tel: (254) 20 53 00 86, (254) 20 53 00 88 Email: arvo@arcc.co.ke |
| 6 | Steel Structures Ltd | Box 49862 Nairobi, Off Outer ring road |
| 7 | InSteel Ltd | OL KALOU ROAD, INDUSTRIAL AREA P.O. BOX 78161 – 00507, Nairobi Email: insteel@insteellimited.com Tel: (+254)20555099/92/80 |
| 8 | Doshi Ironmongers | Box 82077 Mombasa, Miritini |
| 9 | East African Foundary work Group | P.O. Box 48624 - 00100 Nairobi, Kenya Tel: +254-020-861500/1/2/3/4/5, 861401/2 Email: eafw@alloysteel.com Website: www.eafw.com |
| 10 | ASL Ltd | <i>ASL Ltd</i> - Steel Division, Dar es salaam Road, Opposite ABC Bank Industrial Area, P.O. Box 18639, 00500, <i>Nairobi</i> , Kenya Tel: 020-652220 /1/3, 651892 |
| 11 | Devki Steel Mills Ltd | Devki Steel Mills Ltd. Head Office, Ruiru Town P.O. Box 33319-00600, Nairobi, Kenya |
| 12 | Moris & Co Ltd | Mogadishu Rd off Lunga Lunga Rd, Box 18310-00500 Enterprise Rd, <u>Nairobi</u> Tel: +254-206533631 |
| 13 | Tarmal Wire products | Mazeras, Mombasa P.O.Box: 81292-80100 Mombasa. Tel: 0733331786 |
| 14 | Numerical Machining complex Ltd | Workshop Road ,P.O. Box 70660 , Nairobi Mobile no:+254 0716 431 114 Website: www.nmc.co.ke |
| 15 | Mabati Rolling mills (MRM) Ltd | Box 68-80113, Mariakani- Mombasa |
| 16 | Standard Rolling mills Ltd | P.O. Box 8359480100 Mombasa |
| 17 | Tononoka Steels Ltd | P.O.Box: 44689-00100 Nairobi GPO. Tel: +254-202493144.. Mobile: 0722509261 www.tononokasteels.com ; North airport road, Embakasi |

| | | |
|----|-------------------------------|---|
| 18 | Athi River steel, Kenya {CDC} | MOMBASA RD, ATHI RIVER P.O.BOX: 616-00204, ATHI RIVER Tel: +254-20260370 |
| 19 | Corrugated sheets Ltd | Mazeras Mombasa Tel:(020)2024020 Mobile: +(254)722204848 |
| 20 | Alliance steel works | P.O.BOX 72377 - NAIROBI - KENYA Tel: (254) 20 54 17 96, (254) 20 54 58 31 |
| 21 | Apex steel | P.O.BOX 18441 - NAIROBI - KENYA Tel: (254) 20 35 01 01, (254) 20 54 04 56 Email: apexsteel@form-net.com |
| 22 | Kamco stainless | P.O.BOX 41212 - NAIROBI - KENYA Tel: (254) 20 53 69 91, (254) 20 54 25 11 Email kamco@pmail.net |
| 23 | Mild steel | P.O.BOX 78117 - NAIROBI - KENYA Tel: (254) 20 53 34 70, (254) 20 53 34 70 |
| 24 | Techno Steel Industries Ltd | Gilgil Rd off Enterprise Rd P.O.Box: 17512-00500 Enterprise Rd, Nairobi Tel: +254-202446662 Mobile: 0735989587 |
| 25 | Steel Africa | P.O.BOX 81827 - MOMBASA - KENYA Tel: (254) 41 43 30 11, (254) 41 43 38 35 Email steelafrika@net2000ke.com |
| 26 | Bhambra steel | P.O.BOX 39829 - NAIROBI - KENYA Tel: (254) 07 22 52 61 46, (254) 20 55 95 75 Email: daljeet-b@hotmail.com |
| 27 | Accurate Steel Mills | P.O. BOX 74332, NAIROBI, KENYA Enterprise RD Near Kobil, Off Mombasa Rd TEL: 0733 610313, 020 554170 Email: accurate2000@gmail.com |
| 28 | Desbro engineering | P.O.BOX 42469 - NAIROBI - KENYA Tel: (254) 20 53 61 34 , (254) 20 53 77 27 Email: desbro@desbro.org Website: www.desbro.org |
| 29 | Associated steel | P.O.BOX 18639 - NAIROBI - KENYA Tel: (254) 20 53 04 92, (254) 20 54 33 38 Email: asl@ramco-group.com |
| 30 | Kaluworks Ltd | P.O.BOX 89128 -80100 Mombasa - KENYA Tel 0722-205024 |
| 31 | Ndume | PO BOX 62-20116, GILGIL- KENYA |
| 32 | Iron Art | P.O.BOX 27335 - NAIROBI - KENYA Tel: (254) 20 375 21 62, (254) 20 375 21 61 Email: ironart@mitsuminet.com |