EFFECT OF SUPPLY CHAIN PROCESSES OUTSOURCING ON THE PERFORMANCE OF MANUFACTURING FIRMS IN KENYA

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Effect of Supply Chain Processes Outsourcing on the Performance of Manufacturing Firms in Kenya

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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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This thesis has been submitted for examination with our approval as the university supervisors

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DEDICATION

To the pursuit of happiness

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LIST OF ABBREVIATIONS AND ACRONYMS

3PL	Third Party logistics Providers
AHP	Analytical Hierarchy Process
BSC	Balanced Score Card
CBD	Central Business District
CEOs	Chief Executive Officers
CIPS	Chartered Institute of Procurement and Supply
CRM	Customer Relationship Management
EABL	East Africa Breweries Limited
EUROSTAT	European Statistical Office
FY	Financial Year
G4S	Group 4 Security
GDP	Gross Domestic Product
GIS	Geographic Information System
GSCF	Global Supply Chain Forum
HR	Human Resources
ICT	Information Communication Technology
IT	Information Technology
KNBS	Kenya National Bureau of Statistics
KPMG	Klynveld Peat Marwick Goerdeler
MSE	Residual Mean Square
MSR	Regression Mean Square
OLS	Ordinary Least Squares
PhD	Doctor of Philosophy
R&D	Research and Development
RBV	Resource Based View
RDT	Resource Dependency Theory
RoK	Republic of Kenya
RPO	Recruitment Process Outsourcing

SC	Supply Chain
SCC	Supply Chain Council
SCM	Supply Chain Management
SCOR	Supply Chain Operations Reference Manual
SCP	Supply Chain Processes
SES	Senior Executive Service
SLAs	Service Level Agreements
SME	Small and Medium Scale Enterprises
SPE	Performance Excellence
SPSS	Statistical Package for Social Sciences
SRM	Supplier Relationship Management
SSCM	Sustainable Supply Chain Management
USOPM	United States Office of Personnel Management
VIF	Variance Inflation Factors

DEFINITION OF TERMS

Communication processes: refers to the interaction between different people in different levels and different functional departments, which can be conducted by activities such as providing an environment for exchanging ideas; holding open meetings, and using different media to collect and distribute information (Sockalingam & Doswell, 1996).

Decision supply chain processes: These are processes that allocate resources such as; time, material, and capital; and most business processes treat resources in a number of ways (Debevoise, 2013).

Firm: A commercial organization that operates on a for-profit basis and participates in selling goods or services to consumers (Porter, 1985).

Kenya: A republic in E Africa which is a member of the Commonwealth of Nations; formerly a British crown colony and protectorate covering an area of 223,478 square miles, equivalent to 578,808 square kilometres. It lays South of Ethiopia and east of Uganda bordering on Indian Ocean and Somalia to the west (Kenya, 2016).

Manufacturing: The production of merchandise for use or sale using labor and machines, tools, chemical and biological processing, or formulation. The term is most commonly applied to industrial production, in which raw materials are transformed into finished goods on a large scale (Friedman, 2006)

Outsourcing: involves the contracting out of a business function -commonly one previously performed in-house - to an external provider (Overby, 2007)

Primary supply chain processes: These are operational processes that constitute the core business of a firm and are part of its primary value chain (Kleijn & Rorink, 2012).

Secondary supply chain processes: These are processes designed to provide support for primary processes, often by the management resources and or infrastructure required by primary processes (Porter, 1985).

Steering supply chain processes: These are processes used to measure, monitor and control business activities. They do not directly add value to customers, but are required to ensure that the organization operates effectively and efficiently (Leymann & Roller, 1999)

Supply chain: A supply chain consists of all parties involved, directly or indirectly, in fulfilling a customer request (Nagurney, 2006)

Supply chain management: is the management of the flow of goods. It includes the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption (Harland, 1996).

Performance: Refers to the extended supply chain activities in meeting end-customer requirements, including product availability, on-time delivery, and all the necessary inventory and capacity in the supply chain to deliver that performance in a responsive manner (Hausman, 2012)

Supply chain processes: interrelated functions undertaken within a supply chain to deliver a product to the final consumer (Jacoby, 2009)

Supply Chain Processes Outsourcing: strategic outsourcing of one or more supply chain processes to an external service provider (Century Link, 2014).

ABSTRACT

This study sought to examine the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The manufacturing sector is a major contributor of Kenya's GDP, constituting 70 per cent of the industrial sector contribution to GDP. The general objective of this research was to examine the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The study adopted a cross sectional survey research design. The study used descriptive and inferential data analysis. The findings of the multiple regression analysis the outsourcing of all supply chain processes, primary supply chain processes outsourcing has the greatest effect on the improvement of performance for manufacturing firms in Kenya, followed by the outsourcing of steering activities, outsourcing of secondary supply chain processes, outsourcing of communication processes and decision supply chain processes, respectively in order of decreasing effect on performance. Overall, this study concludes that if a firm is keen on improving its supply performance it should outsource all of its supply chain processes but only those functions of the various supply chain processes whose outsourcing leads to the significant improvement of its performance. While those activities within the supply chain processes whose outsourcing does not lead to the improvement of the performance should be undertaken in-house. This study recommends that if a firm intends to improve its performance by outsourcing it primary supply chain processes it should outsource its manufacturing activities, inbound logistics and outbound logistics which provide substantial improvements to the performance. Product development should be undertaken in-house since the consequent gains in performance arising from its outsourcing are minimal. In order to improve a manufacturing firm's performance as a result of outsourcing its secondary supply chain processes, the firm should only outsource its HRM, procurement management and ICT. Returns management outsourcing would not yield a substantial improvement in performance. With regards to steering supply chain processes the firm should outsource it's planning and budgeting functions only since it will yield a substantial improvement in performance. While coordination and monitoring activities should be undertaken in-house since their outsourcing will not yield substantial improvement in performance. It is recommended that if a firm intends to improve its performance by outsourcing its decision processes, it should only outsource it layout decisions, location decisions and inventory management decisions. Technology decisions should not be outsourced. In outsourcing the communication processes, the firms should outsource internal communication, competitor communication, and supplier communication while conducting customer communication in-house. The implication to practice of this study is that the management of manufacturing firms must therefore strategically link the supply chain processes outsourcing to superior performance. The implication to theory and knowledge of this study is that supply chain models theories and frameworks developed elsewhere are also applicable to firms in developing countries with minimal or no modification at all.

CHAPTER ONE

INTRODUCTION

1.1. Background to the Study

This study focused on the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya. This chapter covers the background information of the study, in which a description of the current state of outsourcing globally, regionally and locally is provided. This is followed up with the problem statement, the general and specific objectives of the study, the null and alternative hypotheses, significance of the study, limitations of the study, scope of the study and ends with a chapter of the summary.

Firms faced with declining revenues are constantly looking for ways to cut operational costs. After exhausting the traditional modes of cost cutting such as staff rationalization and overheads reduction, outsourcing has become the most favoured avenue for cost cutting with the idea being to outsource non core business functions leaving the company to concentrate on its core objectives (Gicheni, 2009). According to Overby (2007) outsourcing is often viewed as involving the contracting out of a business function - commonly one previously performed in-house - to an external provider. In this sense, two organizations may enter into a contractual agreement involving an exchange of services and payments. The outsourcing phenomenon has been increasingly receiving attention both from academic and practitioners communities.

1.1.1. Supply Chain Systems

Supply chain activities transform natural resources, raw materials, and components into a finished product that is delivered to the end customer. In sophisticated supply chain systems, used products may re-enter the supply chain at any point where residual value

is recyclable. Supply chains link value chains (Nagurney, 2006). The supply chain not only includes the manufacturer and suppliers, but also transporters, warehouses, retailers, and customers themselves. Within each organization the supply chain includes all functions involved in receiving and filling a customer request. These functions include, but are not limited to, new product development, marketing, operations, distribution, finance, and customer service. The primary purpose for the existence of any supply chain is to satisfy customer needs, in the process generating profits for itself. Supply chain activities begin with a customer order and end when a satisfied customer has paid for his or her purchase. A supply chain is dynamic and involves the constant flow of information, product, and funds between different stages. A typical supply chain may involve a variety of stages. These supply chain stages include: Customers, retailers, wholesalers/distributors, manufacturers component/raw material suppliers (Chopra, Sunil & Meindl, 2004).

SCM is the management of the flow of goods. It includes the movement and storage of raw materials, work-in-process inventory, and finished goods from point of origin to point of consumption. Interconnected or interlinked networks, channels and node businesses are involved in the provision of products and services required by end customers in a supply chain (Harland, 1996). Supply chain management involves design, planning, execution, control, and monitoring of supply chain activities with the objective of creating net value, building a competitive infrastructure, leveraging worldwide logistics, synchronizing supply with demand and measuring performance globally. SCM draws heavily from the areas of operations management, logistics, procurement, and information technology, and strives for an integrated approach (Bartsch, 2013).

Goldman, Nagel and Preiss (1996) state that supply chain processes and relationships increasingly are designed to exploit changes in technology. Changing supply chain processes have evolved from classical paper-based systems and documents, towards reengineered processes that involve electronic capture and transmission of less

document information. A supply chain is a sequence of processes and flows that take place within and between different stages and combine to fill a customer need for a product. The processes in a Supply Chain are divided into series of cycles, each performed at the interface between two successive stages of a Supply Chain (Chopra et.al, 2004). Chopra et.al, (2004) state that supply chain processes can be viewed into two broad categories, cycle view and push/pull views. The processes in a supply chain are divided into a series of cycle, each performed at the interface between two successive stages of a supply chain. Cycle view of Supply chain process includes: customer order cycle, replenishment cycle, manufacturing cycle, procurement cycle. Pull process are initiated by a customer order, whereas push process are initiated and performed in anticipation of customer orders.

1.1.2. Supply Chain Processes Outsourcing

Forty four percent of firms globally have integrated supply chain processes outsourcing into their operations (Eurostat, 2012). Twenty years ago, outsourcing was a world comprised only of those bold early adopters. Few companies dared to venture into this new world during its naissance. Now, sourcing, which includes outsourcing, is a well-established instrument through which companies can optimize their processes. The market, both on the sell and the buy side, has matured. Discussions revolve around the right sourcing mix, with captive shared service centers, multi-vendor outsourcing, offshore, near shore and onshore, cloud computing and centers of excellence as the main ingredients.

The challenge is not only to find the right mix, but to identify one that is flexible so that changing (market) conditions can be reflected in the right sourcing mix (KPMG, 2014). Mainstream adoption of the outsourcing has moved closer to reality. It is not, however, a new revelation. A survey of leadership shows that enterprises are more immediately concerned with strategically shifting IT infrastructures from an in-house to an outsourced model. Within just 5 years, 70 percent of all infrastructures will be outsourced. This is a dramatic shift (Century Link, 2014).

In Africa supply chain processes outsourcing is on an upward trend due to the following drivers for this model include: expanding companies that require additional resources but cannot afford or are not willing to invest in their acquisition; the pursuit and attraction of new talent; the reduction of operating costs; and carbon footprint reduction. Supply chain processes outsourcing has meant that capital investments in this model are minimal. Experts say that Africa, particularly South Africa, is seeing significant growth in supply chain processes outsourcing. A decade ago, the general perception was that outsourcing negatively impacted customer service. Now companies realise that they can enjoy the full financial benefits of outsourcing without compromising on quality (Von Maltitz, (2014).Over the past three years, there has been an increase in organisations' interest in outsourcing of operations to support various back-office functions and processes in areas such as IT, HR, and procurement. Based on KPMG (2012) observations in this market, these three functions have always been the top three in terms of outsourcing services uptake.

Growth expectations are generally aligned with existing functional investments, with the exception of the sourcing and procurement functions – which 63 percent of advisors identified as being targeted for growth over the next 12 months (KPMG, 2012). Northern Africa has already seen many supply chain outsourcing successes coming out of Morocco and Egypt. Morocco, Tunisia, Algeria have mainly grown to serve French-language support requirements. Some Sub-Saharan countries such as Ghana, Kenya and Mauritius are emerging as attractive locations for regional delivery. South Africa is

already a location with global delivery capabilities, and we are seeing that service providers are trying to expand their service offering outside of CRM in this region (Newton, 2014).

Kenya, in an effort to become an emerging economy, is in the course of implementing projects envisioned in its development plan titled Vision 2030. Accordingly, one of the emerging sectors seen as an avenue for creating wealth and employment is the emerging outsourcing sector. The RoK has been keen to intervene and accommodate the concerns of the outsourcing industry players. The strategic pursuits of using outsourcing as an enabler to achieving Vision 2030, and the enhancements/implementation of appropriate policies to enable growth in the outsourcing sector was identified as one avenue to contribute to the economic growth rate of 10% per annum (RoK, 2007).

Kenya's outsourcing strategy is centered on infrastructural and human capacity development, incentive packages to attract outsourcing investments, and marketing Kenya as a viable outsourcing destination. The initiative had four key initiatives (marketing, training, infrastructure development and incentives) which were earmarked as channels through which this strategy would be operationalised. (Wausi, Mgendi & Ngwenyi, 2013). Supply chain processes outsourcing is not about relinquishing control; it's about collaborating to add flexibility to a firm's infrastructure, gaining new market share, entering new regions across the globe and getting products to and from consumers fast. It is the marriage of a firm's operations with a partner capable of becoming a seamless extension of a business while working with to achieve the firm's supply chain objectives (Sheehan, 2011).

1.1.3. Performance of Supply Chains

Performance crosses company boundaries since it includes basic materials, components, subassemblies and finished products, and distribution through various channels to the end customer. It also crosses traditional functional organization lines such as procurement, manufacturing, distribution, marketing & sales, and research & development. To win in the new environment, supply chains need continuous improvement. To achieve this we need performance measures, or metrics which support global Performance improvements rather than narrow company-specific or function-specific (silo) metrics which inhibit chain-wide improvements. A number of performance measures that are expressly designed to support and monitor performance improvements across the supply chain and illustrate the shortcomings of several common metrics exist (Hausman, 2012).

Performance indicators are classified in two clearly defined but closely interrelated categories: functional indicators and end-to-end supply chain indicators. One measures the effectiveness of the function and second measures how well these functions are coordinated. While they are measured separately, they must not be considered in isolation. The choice of functional indicators depends upon industry vertical. Traditionally organizations measure functional indicators and hence have a good understanding of them. With the advent of supply chain and focus on overall coordination and effectiveness, some of the functional indicators come out to be conflicting and counterproductive. These need to be removed (Akyuz &Erman, 2010).

1.1.4. Manufacturing of Final Consumer Products

Manufacturing takes turns under all types of economic systems. In a free market economy, manufacturing is usually directed toward the mass production of products for sale to consumers at a profit (Friedman, 2006). In a collectivist economy, manufacturing is more frequently directed by the state to supply a centrally planned economy (Keith, 1976). In mixed market economies, manufacturing occurs under some degree of

government regulation. Modern manufacturing includes all intermediate processes required for the production and integration of a product's components (Kreiger & Pierce, 2013).

Supply chain processes must constantly evolve to meet changing business requirements, shifts in customer demand and unstable market conditions. These fundamentals are compounded by the responsibility of ensuring a value chain is environmentally sustainable and socially responsible, and the challenge to reach a customer base dispersed not only by geography, but across an ever-growing number of channels. If supply chain is managed in-house, it may be time to consider upgrading to a more efficient, robust and cost-effective infrastructure; time to make the outsource transition (Mclennan, 2014).

1.2. Statement of the Problem

The manufacturing sector contributes 70% Kenya's GDP. Its significance to Kenya's economy and growth cannot be overlooked (KIPPRA, 2013). Despite the complexity and length of manufacturing firms' supply chains, continuous improvement (kaizen) in their performance is integral to the sustainability and overall performance of the firm in a competitive environment. However, this desired optimality in performance is seldom attained (Sillanpää & Kess, 2012). Little (2010) used the SPE index to evaluate the performance of manufacturing firms globally. With a possible maximum score of 1.750 based on the incorporation of supply chain best practices, the best firm globally scored 1.065 with an average score of all firms at 0.760, with those in the North America, Far East and Europe outperforming their compatriots in Africa and Latin America.

This is indicative that performance is poor in majority of manufacturing firms especially in economically developing regions of the world. In further ranking of the individual country's performance by Little (2010) Kenya outperforms most of her Sub Saharan Africa Counterparts with the exception of Nigeria and South Africa but still falls below

the global average score indicated earlier. However, Mwirigi and Were (2014) contend that in Kenya there has been a rise in complaints by the public, professionals and other stakeholder's about the performance with the overall sentiment that performance is way below the stakeholders' expectations. This is indicative that performance is poor in Kenya. Manufacturing firms, and indeed all firms, aim at improving their performance (Mohiuddin & Su, 2013). In the pursuit of improved performance manufacturing firms have turned towards supply chain processes outsourcing (Muthoni & Nyakagwa, 2014). However the link between supply chain processes outsourcing and its effect on the

In the developing economy of Kenya studies have primarily on focused on the benefits of outsourcing as well as factors influencing the adoption of outsourcing (Oduk, 2013; Mogire & Gakure, 2014; Gichuru, 2012). These studies have in most cases adopted a case study approach (Maku & Iravo, 2013; Kilasi, Juma, & Mathooko, 2013) or a descriptive research design (Mukiri, 2011; Njambi & Katuse, 2013).A descriptive research design presents the possibility of error and subjectivity since questions are restricting and prescriptive (Bryman & Bell, 2011) Therefore this study sought to examine the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya.

1.3. Objectives of the Study

1.3.1. General Objective

To examine the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya

1.3.2. Specific Objectives

1. To determine the effect of primary supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
2. To establish the effect of secondary supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
3. To examine the effect of steering supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
4. To determine the effect of decision supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
5. To assess the effect of communication supply chain processes outsourcing on the performance of manufacturing firms in Kenya.

1.4. Hypotheses

This research was based on the following hypotheses which were consequent to a comprehensive study of literature, wholesomely represent ted in the next chapter.

1. **H_0:** Primary supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya.
2. **H_0:** Secondary supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya.
3. **H_0:** Steering supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya.
4. **H_0:** Decision supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya.
5. **H_0:** Communication supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya.

1.5. Significance of the Study

1.5.1. Scholars and Researchers

This research is of benefit to scholars in that it will provide both theoretical and empirical literature in to field of outsourcing by providing them with a foundation for further research into the study of outsourcing of supply chain processes and performance. Furthermore the study will also equip researchers with a broad view of the various schools of thought on the composition of the entire spectrum of supply chain processes.

1.5.2. Legislatures and Policy Makers

This study is of informational benefit to legislatures and policy makers in guiding them in the formulation of an appropriate regulatory framework for the governance of supply chain processes outsourcing. This study will help these regulators and policy makers understand the trends in supply chain processes outsourcing and thereby formulate appropriate proactive future oriented policies.

1.5.3. Outsourcing Firms

As previously noted, 44% percent of firms globally have integrated supply chain processes outsourcing into their operations (Eurostat, 2012). Therefore this research is beneficial to these firms, in helping them understand the effect of supply chain processes outosurcing on their performance. Outsourcing firms will also find this study important to their operations in determining which supply chain processes to outsource in order to improve their performance, and which processes to undertake in-house in order to ensure optimal performance of the firm.

1.5.4. Outsourcing Agents

This study is of importance to the other 66% of firms globally in helping them determine whether to incorporate supply chain processes outsourcing in their operations in pursuit of improved performance. The study is beneficial to outsourcing service providers/agents, since it will help them understand the impact of their services on the performance of their clients.

1.6. Scope of the Study

This study aimed at examining the effect of supply chain processes outsourcing on performance for manufacturing firms in Nairobi's industrial area. The study focused on the outsourcing of supply chain processes as the independent variables and of performance as the dependent variables. The study utilized primary data. The primary data was collected through a questionnaire administered to supply chain managers or their equivalents in manufacturing firms located in Industrial area. This research covered a period of eighteen months.

1.7. Limitation of the Study

Due to the sensitive nature of information required for this study, a portion of the respondents were hesitant in providing the required information as per the questionnaire. However the researcher overcame this limitation by ensuring them of their confidentiality and the pure academic use of their responses. Due to the focus of the study on the complex nature of supply chains (Mentzer, et al. 2001), the study suffered from the in availability of data from the manufacturing firms. In such cases the study adopted the study referred to existing documentation and in cases where the documentation was lacking the study adopted simulative models to obtain the missing data.

Secondly there is always a risk in borrowing from theories in other disciplines for a given study. In this case this study has borrowed from strategic management and also from theories in ICT to conceptualize the various aspects of variables considered in this study. While such borrowing has been carried out previously in studies focusing on supply chain processes and performance (Kroes, 2007), there are instances where a mismatch arises between the study and the variable therefore the study may lose its overall objectives. This study was supported in the adoption of the theories due to borrowing and the establishment of a match between the theories and supply chain management as well as performance (Kroes, 2007).

Thirdly, although the study focused on manufacturing firms in Nairobi's industrial area to generalize on all firms in Kenya. A more elaborate study focusing on all firms in Kenya was not possible due to resource and time constraints. However this limitation is more than made up for with the depth and extensive nature of the study focusing on a representative number of firms. Thus it provided adequate data and sufficient data to provide empirical evidence on the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya.

CHAPTER TWO

LITERATURE REVIEW

2.1. Introduction

This chapter reviews the theoretical literature on the area of supply chain processes outsourcing and performance. It is organized as follows: theoretical framework, conceptual framework, review of variables, empirical literature review, research gap, and summary of the chapter. Literature review facilitates critical summary of the current knowledge in the area under investigation, identifying any strengths and weaknesses in previous work. Thus, it helps in identifying the weaknesses in the current research and therefore eliminate the potential weaknesses, whilst bringing to the fore the potential strengths. In addition, a good and full literature search will provide the context within which to place your study (Yin, 2009).

2.2. Theoretical Framework

According to Wacker (2008), a theory is an ordered set of assertions about a generic behavior or structure assumed to hold throughout a significantly broad range of specific instances while a model is a purposeful representation of reality. Model and Theory-building is important because it provides a framework for analysis, facilitates the efficient development of the field. To be a good theory or model, it must follow the virtues criteria for good theory, including uniqueness, parsimony, conservation, generalizability, fecundity, internal consistency, empirical riskiness, and abstraction. This section reviews the theories and models associated with the study and practice of supply chains, supply chain processes and eventually the performance.

2.2.1. Supply Chain Processes

Primary Processes

The Kleijn and Rorink (2012) model states that organisations try to understand changes in time to adjust products, structures, processes and goals in an effective way. There can be several reasons for this: to encourage internal entrepreneurship and flexibility, to be able to launch new profitable products on the market with a short life cycle and the will to work in a customer focused and product directed way. Kleijn and Rorink (2012) identify five categories of supply chain/business processes. These are primary processes, secondary processes, steering processes, decision processes and communication processes. The Kleijn and Rorink model faces the main criticism that it is a general framework attempting to cover the needs of a wide range of business organisations. However, it is very difficult to produce a standard SCP recipe of success for every business sector and under all circumstances (Eftekhari & Akhavan, 2013). This model is of relevance to this study in that it helps to identify the five categories of supply chain processes in a manufacturing firm.

According to Porter (1985) value chain model, primary processes are end-to-end, cross-functional and deliver value to customers. The primary activities are: Inbound Logistics - involve relationships with suppliers and include all the activities required to receive, store, and disseminate inputs; operations - are all the activities required to transform inputs into outputs (products and services); outbound Logistics - include all the activities required to collect, store, and distribute the output; marketing and sales - activities inform buyers about products and services, induce buyers to purchase them, and facilitate their purchase; service - includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered. Kleijn and Rorink (2012) also concur with Porter (1985) on the primary processes. But in addition also incorporate purchasing into the primary processes. The main criticism of the value chain model is that there is no standard or scientific way for using value chain

analysis it is more like an art which varies from one person to another and totally relies on the subjective judgment, trial and error, and experimentation of the analyzer. (Sarieddine, 2013).This model is important to this study in that it provides the basis of supply chain processes analysis and in this study compliments the Kleijn and Rorink model hence making it relevant for this study.

The SCOR model, developed by the SCC in 1996 is the most commonly cited SCM framework. The SCOR model provides a unique framework that links business processes, metrics, best practices and technology features into a unified structure to support communication among supply chain partners and to improve the effectiveness of supply chain management and related supply chain improvement activities. SCOR is used to identify measure, reorganize and improve supply chain processes through a cyclical process that includes: capturing the configuration of a supply chain; measuring the performance of the supply chain and comparing against internal and external industry goals; re-aligning supply chain processes and best practices to fulfill unachieved or changing business objectives (Lockamy& McCormack, 2004).

When it was originally developed in 1996, the SCOR model had four core business processes. These processes were plan, source, make, and deliver. They served as the foundation of the SCOR model. Later, in 2001, a fifth process – return – was added to enhance the validity of the model. Each of these processes is implemented through four individual levels. The first level defines the scope and content of the model itself, as well as specifying basis for competition performance targets. At level two, companies implement their operations strategies dependent upon the configurations they choose for their supply chains. Level three defines inputs, outputs, and flows of each transactional element, and finally, level four defines the implementation of specific supply chain management practices. The source, makes, and deliver processes of the SCOR model create a continuous chain of activity throughout a company's internal operations and, potentially, across the whole inter-organizational supply chain (Lockamy & McCormack, 2004).

The main criticism of the SCOR model is quite simplistic in its approach to the supply chain processes especially given the dynamism and complexity of modern supply chains and was created in an era where it is hard to fit all its activities in the contemporary internet age (Hussein, 2008). However this model is similar to the Kleijn and Rorink model and Porter's value chain model hence making it relevant to this study in the outline of specific primary supply chain activities. These models informed research hypothesis one.

Secondary Processes

The key differentiator between primary and support processes is that support processes do not generate direct value to customers while the primary processes do. Secondary activities are: procurement - is the acquisition of inputs, or resources, for the firm; human resource management - consists of all activities involved in recruiting, hiring, training, developing, compensating and (if necessary) dismissing or laying off personnel; technological development - pertains to the equipment, hardware, software, procedures and technical knowledge brought to bear in the firm's transformation of inputs into outputs; Infrastructure - serves the company's needs and ties its various parts together, it consists of functions or departments such as accounting, legal, finance, planning, public affairs, government relations, quality assurance and general management (Porter, 1985). The value chain model is relevant to this study in that it specifies four processes which comprise the secondary supply chain processes. However it deviates from the accepted norm of taking procurement as a primary function (Kleijn & Rorink, 2012).

According to Dietz (1994) each of the support processes can involve a life cycle of resources and are often associated with functional areas. Capacity management typically involves a number of cross-functional activities, purchase planning, engineering design, construction and the process of putting the production capacity. Each of these activities could include cross-functional teams with representatives from finance, purchasing,

engineering, production manufactured, IT and other functional organizations. The fact that support processes do not directly generate value to customers does not mean that they are not important to the organization. The support processes can be strategic and fundamental to the Organization to the extent that increases their ability to effectively accomplish the primary processes. (Lind, 1996). The main criticism of this model is that there is a lack of integrated tool sets that allow modelling and analysis of the business environment. Most of the existing tools come from the area of software development and usually concentrate on conceptual business modelling (Valiris & Glykas 1999). This model is of relevance to this study in helping to identify the supply chain processes that compose the support function whilst complimenting the other models previously discussed.

A framework that supports Porter's view of secondary supply chain processes is the Mentzer framework. Mentzer and his colleagues defined supply chain management in this analysis as the systematic, strategic coordination of the traditional business functions and tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long term performance of the individual companies and the supply chain as a whole. SCM involves multiple firms and multiple business activities, as well as process orientation to coordinate activities across functions and across firms within the supply chain (Mentzer et al, 2001).

In the framework, the supply chain is presented as a pipeline, illustrating the supply chain flows, the inter-functional coordination of traditional business functions, and the inter-corporate coordination between supply chain partners to ultimately provide value and satisfaction for the consumer. Customer value and satisfaction is recognized by Mentzer and the others to be a necessary factor to achieve performance and profitability for both individual companies in the supply chain as well as the supply chain as a whole (Mentzer, et.al, 2001). The main criticism of this model is that while it focuses on cross-functional interaction within a firm and on the relationships developed with other

supply chain components, the processes that need to be implemented are not described (Naslund & Williamson, 2010). This model is of relevance to this study since it informed the establishment of boundaries for secondary processes and subsequently informed research hypothesis two.

Steering Processes

The steering/supporting processes, also called the management processes, correspond to the definition of an organization's policy and a strategy and to the steering of the actions taken to achieve the organization's goals. Management processes are the methods that aid the structuring, investigation, analysis, decision-making and communication of business issues ((Lawrence 1997). Contingency theory asserts that when managers make a decision, they must take into account all aspects of the current situation and act on those aspects that are key to the situation at hand (Mikes & Kaplan, 2014). Contingency theory, although having several strengths, generally falls short in trying to explain why leaders with certain leadership styles are effective in some situations but not others. It is also criticized that it does not correlate well with other standard leadership measures. Contingency theory also fails to adequately explain what should be done about a leader/situation mismatch in the workplace (Northouse, 2007). This model is relevant to this study in that it recognizes that some of the managerial functions considered in this study require spontaneity.

Chaos theory arises from a chaotic and random world; they are equally chaotic in organizations too. It recognizes that events indeed are rarely controlled. Chaos theorists suggest that systems naturally go to more complexity, and as they do so, these systems become more volatile and must expend more energy to maintain that complexity whilst seeking more structure to maintain stability. This trend continues until the system splits, combines with another complex system or falls apart entirely (Parker and Stacey 1994). Chaos Theory’s main criticism is that it is rarely used as a management tool due to its complicated nature, unpredictability and instability. Critics contend that chaos theory is

a set of principles for the natural sciences and that application to social sciences is overextension of the ideas. The chaos theory is relevant for this study in that it recognizes the complexity and sometimes chaotic nature of managerial processes in an organization hence useful is establishing alternative ways of seeking stability in the system such as supply chain processes outsourcing (Vinuelas & Githens, 2010).

The GSCF framework, which focuses mostly on the management/steering processes of the supply chain, identifies eight key processes that form the foundation for supply chain management The eight key business processes are; customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, supplier relationship management, product development and commercialization and return management (Lambert, Cooper & Pagh,1998). Each process runs cross-functionally, cutting through functional silos within each organization. Functional silos are defined, for example, as marketing, research and development, finance, production, purchasing, and logistics.

Of the eight processes, customer relationship management and supplier relationship management provide a crucial link to external companies within the chain. Although the processes should be considered by all companies in each supply chain, the significance of each process may differ some companies may need to link just one key process while for other companies it is appropriate to link multiple processes (Croxton, García-Dastugue, Lambert & Rogers,2001). The main criticism of the GSCF framework is that it is broad in scope. The large span could create implementation challenges, especially as it also recommends that organizations shift from functional orientation to processes orientation/management (Vinuelas & Githens, 2010). This model is of importance to this study since the eight functions it identifies as core to SCM all require the four steering activities this study looks into. That is planning coordination, budgeting and monitoring. These models informed research hypothesis three.

Decision Processes

According to Debevoise (2013), decisions can increase or reduce risk, and when that risk reaches a threshold yet more events arise, invoking more process activities. There are many examples of decision activities that cause optional or unanticipated actionable events in business processes. Prominent decision theories include the rational model and the model of bounded rationality. The rational model assumes a rational and completely informed decision maker (economic man) as described by neoclassical microeconomic theory around the middle of the previous century. The process of rational decision-making comprises a number of steps, such as: intelligence: finding occasions for making a decision; design: inventing, developing and analysing possible courses of action; choice: selecting a particular course of action from those available; and review: assessing past choices (Turpin & Marais, 2004).

The main criticism of the rational model arises from its assumptions which include: maximization of benefits and minimization of any costs is the motivator of decision making; availability of perfect information to decision makers; quantifiability of decision variables; and availability of the cognitive ability, time and resources for evaluation of alternatives. This assumption may not be realistic in the practical decision making setting (Boundless, 2016). This model is relevant to this study since in making supply chain decisions one is required to have complete and up to date information. Its applicability is further appended by the fact the assumptions of the rational decision making model are a necessity in making good decisions in supply chain management.

The sustainability of a supply chain requires appropriate decision making and coordination. Therefore SSCM model includes the social sustainability economic viability and environmental sustainability of a firm's supply chain and has important implications for firms' survival and long term development. Sustainability is development that meets the needs of the present without compromising the ability of future generations to meet their needs. There are aspects of sustainability often

mentioned but rarely included in explicit definitions. These aspects are risk management, transparency, strategy, and culture. SSCM is defined as the strategic, transparent integration and achievement of an organization's social, environmental, and economic goals in the systematic coordination of key inter-organizational business processes and decisions for improving the long-term economic performance of the individual company and its supply chains (Carter and Rogers 2008). The main criticisms of SSCM are that, bigger size firm tend to be more willing to participate in green supply chain initiative. Lack of supportive corporate structures and processes, lack of management commitment, focus on cost reduction and lack of training can run counter to SSCM (Tay, Rahman, Aziz, & Sidek, 2015). This model is relevant to this study in that the decisions that are made with regards to SCM in an organization must pass the test of sustainability in order to ensure the going concern nature of the entity itself. These models informed research hypothesis four.

Communication Processes

According to Sockalingam and Doswell (1996) suitable communication processes in organizations, not only provides a suitable environment for implementing the project but it also facilitates the deployment of the project. In addition, by effective communication the fears and insecurities of employees are eliminated. Croft (2004) identifies the following models: Aristotle model, Laswell model, Schram's model, Berlo's model. Croft (2004) states that Aristotle represented communication as might an orator who speaks to large audiences. His model incorporates the speaker, message and the listener. Criticism against the model is that it is one way of communication, that is, it is sender centered giving (the receiver to does not provide feedback, it ignores the environmental factors in which communication takes place (Dainton, & Elain, 2011). This model is relevant to this study in that prior to feedback most of the supply chain communication takes this format of sender-message-receiver

Laswell's model includes considerations of a variety of factors being considered to determine the impact of a communication. The elements of this model include: the communicator, the message, the audience, eventually resulting in the impact of communication (Croft, 2004). The major criticism of Lasswell's Model is that it does not include feedback, it ignores the possibility of noise, is very linear and it does not consider barriers in the communication process (Dainton, & Elain, 2011). This model is relevant to this study in that supply chain communication takes the model explained above eventually resulting into impact for the organization and all of its stakeholders.

The Schram model considers the fields of experience of the sender and receiver. The sender encodes the message, based upon the sender's field of experience. The user's field of experience guides decoding. The main criticism of this model is that if there is no commonality in the sender's and receiver's field of experience, then communication does not take place (Dainton, & Elain, 2011). Berlo's model took a different approach to constructing a model. He created what he called a model of the ingredients of communication. This model identifies controlling factors for four identified elements of communication: Source, Message, Channel, and Receiver (Croft, 2004). These models facilitated the identification of the key communication supply chain processes as supplier communication, customer communication, internal communication and competitor competition and informed research hypothesis five.

2.2.2. Supply Chain Theories.

Supply chain network theory argues that firms rely not only on their relationship with direct partners but with the extended network of relationships with supply chain firms. It argues that performance can only be achieved through efficiently and effectively orchestrated supply chains. Therefore the focus of this theory is to develop long-term, trust based relationship between supply chain firms. Supply chains have often been conceptualized as simple linear systems. They are represented by an event dependent series of firms interacting through dyadic relationships. However, a linear conception of

sequential dyadic relationships, while appealing, grossly oversimplifies and distorts the realities of modern supply chains (Chopra, Sunil & Meindl, 2004). The linear view using dyadic analysis fails to adequately account for the interdependence between large numbers of heterogeneous firms present in supply chain systems (Choi & Wu, 2009). Responding appropriately to exigencies requires supply chain managers to have an understanding of the underlying structure of their system and how the firms within their system interact. If modern supply chains are complex and adaptation to change necessary, then there is a need to re-conceptualize supply chains away from simple linear systems towards complex adaptive systems (Li, Yang, Sun, Ji & Feng, 2010). This model is relevant to this study since its overall simplicity helps in perceiving the supply chain of a manufacturing firm in its entirety from the perceptive of source to consumption.

According to Tajbakhsh & Hassini (2015) the social networks theory looks at the behavioural and social aspects of many different relationship types, including firm-firm, individual-firm and individual-individual relationships. It helps to analyse these relationships from different perspectives such as technical, financial and social elements. Supply chain management has both hard (that is, technical) and soft (that is, people) aspects. They reflect the fact that the field is at the intersection of many disciplines, such as marketing, procurement, management, operations research, logistics, and so on. It might be supposed that social network analysis – originating as it does in social psychology – would have its greatest and most natural application on the soft side of SCM. In truth, however, social network analysis can be fruitfully applied to both sides of the equation. Such application should be to the extent that this hard/soft distinction translates into different kinds of ties, such as movement of supplies versus personal friendships. (Borgatti & Li, 2009). The main criticism of this model is that it views the supply chain as a social phenomenon whose efficiency and effectiveness is influenced by of the actors to establish social relationships (Tajbakhsh & Hassini, 2015). This model is relevant to this study since it is impossible to alienate a supply chain from the social actors.

According to (Aigbogun, Ghazali, & Razali, 2016) Principal agent theory is concerned with the governance and control mechanism structure of firms to mitigate the chances of opportunism, conflicting interests and information asymmetry between the Principle (delegating authority) and the agent. Agency theory is relevant for the situations wherein one party (the principal) delegates authority – in terms of control and decision-making about certain tasks – to another party (the agent). More recently, SCM scholars have shown growing interest in using agency theory to understand how participants within the SC manage risks, align incentives and forge relationships (Craighead, 2009).

Principal-agent relationships are characterized by a principal and an agent who interact within an environment characterized by imperfect information and uncertainty. The principal-agent theory assumes that the agent has certain tasks to fulfill for the principal. Both parties seek the maximum benefit for themselves that involves three aspects (Ebers & Gotsch, 1995). The main criticism of this approach is that the agent may act in his own interest rather than in the interest of the principal. Hence, agents may undermine agency relationships (Aigbogun, Ghazali, & Razali, 2016). This model is relevant to this study due to the principal agent relationship between the outsourcing client and the outsourcing agent exhibited in an outsourcing contract. According to Colman (1999) game theory tries to enlighten the interactions between individuals or groups of people whose goals are opposed conflicting, or at least partially competing. Its goal is to explain, or to provide a normative guide for, rational behavior of individuals confronted with strategic decisions or involved in social interaction. It aims at the provision of an optimal strategy for parties involved in a conflicting or competitive situation. The theory is concerned with optimal strategic behavior, equilibrium situations, stable outcomes, bargaining, coalition formation, equitable allocations, and similar concepts related to resolving group differences.

Traditionally, game theory can be divided into two branches: non-cooperative and cooperative game theory. Non-cooperative game theory uses the notion of a strategic equilibrium or simply equilibrium to determine rational outcomes of a game. Numerous

equilibrium concepts have been proposed in the literature. Some widely used concepts are dominant strategy Nash equilibrium and sub game perfect equilibrium. The main criticism of game theory is there is a constant difficulty with game theory modeling is defining, limiting, isolating or accounting for every set of factors and variables that influence strategy and outcome (Stillera et al., 2014). This model is applicable to this study due to the fact that firms under study operate in competitive environment where they act rationally in the adoption of the most optimal strategy.

2.2.3. Outsourcing theories

According to Grover, Teng and Cheon (1998) as well as Perunović and Penderson (2013), there exists a contingency model for examining different aspects of outsourcing based on the following theories: the resource-based view, resource dependency, transaction-cost economics theory, According to Barney & Hesterly (1996) the core premise of the resource-based view is that resources and capabilities can vary significantly across firms. The resource-based view in outsourcing builds from a proposition that an organization that lacks valuable, rare, inimitable and organised resources and capabilities, shall seek for an external provider in order to overcome that weakness. Therefore the most prominent use of the theory is in the Preparation phase of the outsourcing process.

The theory has been also used to explain some of the key issues of the managing relationship and reconsideration phases. The main criticisms of this theory are that: different resource configurations can generate the same value for firms and thus would not be competitive advantage, the role of product markets is underdeveloped in the argument, limited focus on capabilities, retrospective causality issues: any current success could be attributed to a number of reasons (e.g. unique resources), but the causality is not always clear (Kozlenkova, 2014). This relevance to this study since firms that lack resources that are unique, rare, inimitable and valuable will seek them from an external provider.

According to Hillman, Withers, and Collins (2009) RDT examines organizational decision making in light of the impact of the environment on the organization. RDT recognizes that the key to organizational survival is the ability to acquire and maintain resources. An organization must be open to its environment due to its dependence on that environment to obtain critical resources such as personnel, information, raw materials and technology. Resource acquisition may be problematic and unpredictable. To guarantee the flow of resources, therefore, a firm will adapt to changes in its environment that impact the flow of resources to the firm. Adaptation is not passive, however, but rather a strategic choice to cope with pressure in the environment.

Successful organizations, therefore, attempt to minimize their dependence on or increase their influence over organizations in their environment. RDT argues that no firm can exclusively rely on its own resources to survive. The effectiveness of a firm, therefore, is related to its ability to acquire needed resources from external vendors. (Birkinshaw, Toulan & Arnold, 2001). The main criticisms of this theory are that: it not measure resource dependency but simply the exchange of goods as usual in economic theory and thus it could be economic and not political power motives that caused the exchange, It concentrates on material resources, it was based wrongly on too narrow a concept of power over controlling objective resources: Resources but also alternatives and interests are socially constructed and majority of its assumptions are also problematic (Drees, & Heugens, 2013). This theory is relevant to this study since firms which lack the required resources depend on external providers (outsourcing agents) to acquire such resources.

According to Williamson (1975) if using the markets resulted in lower costs than carrying out the transaction internally (using hierarchies), it should be bought from the market. He suggested that transactions should be organized within a firm when the cost of doing so was lower than the cost of using the market. Although the transaction cost economics is often seen as the historical heritage behind the

concept of outsourcing, other studies discussed similar issues, although they used different concepts. Coase (1937) suggested that transactions should be organized within a firm when the cost of doing this was lower than the cost of using the market.

The main criticisms of this theory are that, it makes narrow assumption about human nature and interpretation of economic objectives. It fails to consider the social relations in which economic behavior is embedded. It has no room for the process aspects introduced by more substantive notions of bounded rationality. It is not clear how capabilities are conceptualised, dimensionalised, and measured, and it is not clear how capabilities emerge and are changed by individual action. The theory of the firm seeks to explain the governance of individual transactions or clusters of attributes, without identifying how the governance of a particular transaction may depend on how previous transactions were governed (Foss & Klein, 2010). This theory is relevant to this study since firms opt to outsource processes which can procured more cheaply from external sources as opposed to obtaining them in-house.

2.2.4. Performance Measurement

The BSC model is a framework or structure created for integrating indicators derived from the strategy that continues to retain financial indicators of the past actions, completed with inductors of future financial actions. The inductors which include the customers, the processes and the perspectives of learning and growth, are derived from an explicit and rigorous translation of the strategy of the organization into tangible objectives and indicators. The original model is composed by four perspectives, namely: financial perspective, customer perspective, internal processes perspective, and learning and growth perspective. The BSC can be for the measurement of Performance by splitting the measures of timely delivery, product quality, flexibility, costs, productivity and reliability (Barber, 2008).

The main criticisms of this framework are that, the high rates of implementation failure and considerable variations in both interpretation and practice of the BSC demonstrates serious limitations in concept and in practice. Scholars posit the BSC is well suited for engineering firms and less for other industry types. The critics point out that suggestions for the selection of strategic objectives and performance measures leave out several interests of important stakeholders. In fact, the conception of the BSC only caters for the interests of the shareholders while ignoring the interests of other key stakeholders such as suppliers, the government, and the environment (Parmenter, 2015). This model is relevant to this study since its original four parameters provide a basis for most of the firms considered herein for evaluating their performance.

The SCOR model integrates the concepts of business process reengineering, benchmarking, and process measurement into a cross-functional framework which consists of three levels: the top one (level I) deals with process types, level II is the configuration level and deals with process categories, and level III is the process element level. Based on the premises that the better the alignment between marketplace and the strategic response of a SC, the better the bottom-line performance, its main aim is to improve such alignment. Its strength is that it provides a useful tool for the upper management to facilitate communication. The SCOR model has been proposed as a tool useful for the management and integration of the SC. Specifically, the two lowest levels may help in defining indicators for the measurement of Performance, thus helping the quality improvement of the SC as a whole.

The indicators proposed by the SCOR model can be classified within five different classes, namely: reliability, responsiveness, agility, cost, coordination and assets (Bigliardi & Bottani, 2014). The main criticisms against the SCOR model as a tool for measurement of performance are that: it is difficult to find information about the model, which is evidence of the results due to the lack of case studies have been published or released and where can exemplify the implementation of the SCOR model. SCOR is a diagnostic methodology and design, but its reach does not extend to the

implementation of change, which is important to introduce a methodology to any process. The SCOR model implementation requires the involvement, support and leadership from the highest level of the company. It also requires the dissemination and training the CS concept of SCOR in the whole process, and the agreement with the other actors in the supply chain, at least supplier and distributor (Salazar, Caro, & Cavazos 2012). This model is relevant to this study since most of the supply chain functions of the firms under consideration in this study incorporate the five functions of the model in their supply chains.

The AHP model is a decision making tool proposed by Saaty in 1980. It was developed to reflect the way people naturally behave and think, thus it can help in describing the general decision operation by decomposing a complex problem into a multi-level hierarchic structure of objectives, criteria, sub-criteria and alternatives. Specifically, the AHP is a general measurement theory that depends on the values and judgments of individuals and groups. More precisely, judgments are brought together according to a multilevel hierarchic structure that allows deriving priorities. AHP involves 7 steps, namely: problem decomposition and hierarchy construction, alternatives decomposition, pair-wise comparison, weight calculation, consistency check, hierarchical synthesis, and priority determination for all alternatives. The major advantage of the hierarchical structure is that it allows for a detailed, structured and systematic decomposition of the overall problem into its fundamental components and interdependencies, with a large degree of flexibility. In measurement three performance levels are required: the strategic, tactical and operative ones (Bendoly, Rosenzweig & Stratman, 2009).

Most of the criticisms on AHP involves a phenomenon called rank reversal. The additive hierarchical composition of conventional AHP, which leads to the possibility of occurrence of the Rank Reversal phenomenon (adding an irrelevant alternative may cause a reversal in the ranking at the top). In the context of a variable number of alternatives this rank reversal possibility is likely to be a shortcoming of the aggregation method, since the global priorities obtained and the corresponding rankings can be seen,

to some extent, as arbitrary (Nefeslioglu, Sezer & Gokceoglu, 2013). This theory is relevant to this study since the performance of any supply chain can be broken down into a multi-level hierarchic structure of objectives and guided the study in establishing the attributes that would be adopted in establishing appropriate measures/indicators of performance. These measures/indicators were timeliness, productivity, costs and quality.

2.3. Conceptual Framework

According to Ravitch, and Riggan (2012) a conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. Strong conceptual frameworks capture something real and do this in a way that is easy to remember and apply. Conceptual frameworks are particularly useful as organizing devices in empirical research. One set of scholars has applied the notion of conceptual framework to deductive, empirical, research at the micro- or individual study level. Conceptual frameworks are abstract representations, connected to the research project's goal that directs the collection and analysis of data. A description of this framework contributes to a research report in at least two ways because it; firstly, identifies research variables, and secondly, clarifies relationships among the variables. Linked to the problem statement, the conceptual framework sets the stage for presentation of the specific research question that drives the investigation being reported (Shields & Rangarjan, 2013). Scholars argue that a conceptual or theoretical framework always underlies a research study (Fraenkel & Wallen, 2000). From the analysis of the literature presented in this chapter the conceptual framework of this study can be presented as shown in figure 2.1.

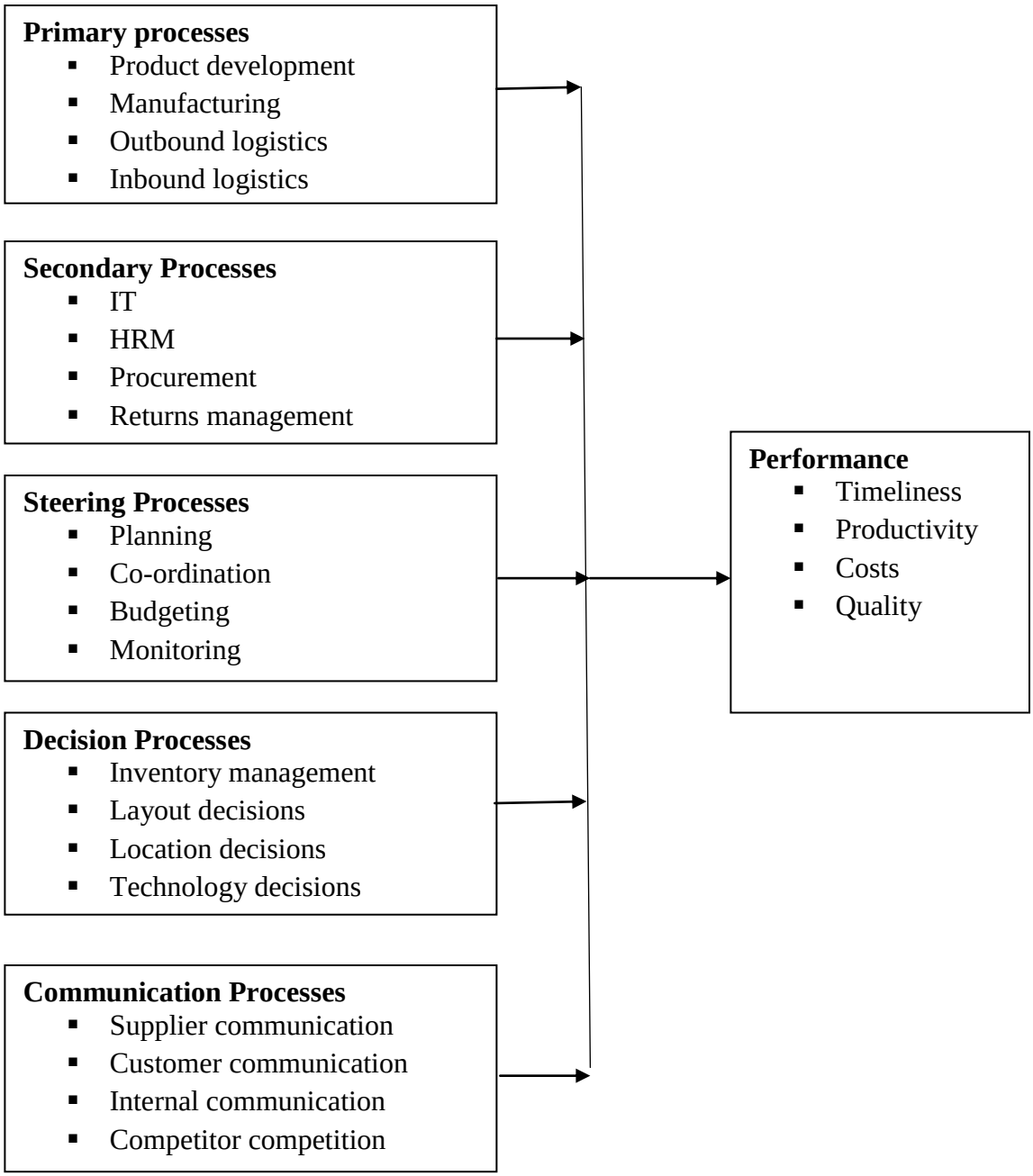

Figure 2. 1: Conceptual Framework

2.3.1. Primary Processes

The value chain model by Porter (1985) states that include: inbound Logistics - involve relationships with suppliers and include all the activities required to receive, store, and disseminate inputs; operations - are all the activities required to transform inputs into outputs (products and services); outbound Logistics - include all the activities required to collect, store, and distribute the output; marketing and sales - activities inform buyers about products and services, induce buyers to purchase them, and facilitate their purchase; service - includes all the activities required to keep the product or service working effectively for the buyer after it is sold and delivered.

2.3.2. Secondary Processes

According to Kleijn and Rorink (2012) Secondary supply chain processes are: procurement - is the acquisition of inputs, or resources, for the firm; human resource management - consists of all activities involved in recruiting, hiring, training, developing, compensating and (if necessary) dismissing or laying off personnel; technological development - pertains to the equipment, hardware, software, procedures and technical knowledge brought to bear in the firm's transformation of inputs into outputs; Infrastructure - serves the company's needs and ties its various parts together, it consists of functions or departments such as accounting, legal, finance, planning, public affairs, government relations, quality assurance and general management

Each of these activities could include cross-functional teams with representatives from finance, purchasing, engineering, production manufactured, IT and other functional organizations. The fact that support processes do not directly generate value to customers does not mean that they are not important to the organization. The support processes can be strategic and fundamental to the Organization to the extent that increases their ability to effectively accomplish the primary processes (Lind, 1996). These aspects informed the reduction of secondary supply chain processes for this study into: IT, HRM, procurement and returns management.

2.3.3. Steering Processes

The GSCF framework, which focuses mostly on the management/steering processes of the supply chain, identifies eight key processes that form the foundation for steering supply chain processes. The eight key business processes are; customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, supplier relationship management, product development and commercialization and return management (Lambert, Cooper & Pagh, 1998).

Henri Fayol gained world-wide fame for his 14 general principles of management. He distinguished six general activities for industrial enterprises: technical, commercial, financial, security, accounting and managerial. He defined five functions of management for the management component and these are still seen as relevant to organizations today. These five functions focus on the relationship between personnel and its management and they provide points of reference so that problems can be solved in a creative manner. Fayol broke down the management functions into: planning, organizing, staffing, controlling, directing and coordination (Van Vliet, 2011). For purposes of this study management functions have been taken to include planning coordination budgeting and monitoring.

2.3.4. Decision Processes

Supply chain management decisions are often said to belong to one of three levels; the strategic, the tactical, or the operational level. The three levels are related to each other and it all depends on the level of detail and timeframe. Strategic decisions are linked to long term objectives. An example would be the location decision of a new firm. The tactic is how to make it happen at a high level but detailed at smaller time slots. An example is the layout decision of the firm or the technology decision to position the firm as the most developed company in terms of supply chain in a given sector. The decision of how to implement a ‘vision’ by choosing to automate factories against

outsourcing them or any other choice at high level is the tactical approach. The operational decisions are related to how to make the tactical approach happen in the short term, an example is routine decisions relating to inventory management (Bruzelius & Skärvad, 2008).

The rational decision-making model begins by defining the problem. The problem is the discrepancy between the existing and the desired state. Once the decision maker has defined the problem, he or she will have to identify the decision criteria that will be important in solving the problem. The identified criteria are not often of equal importance, hence the third step will be to weigh the criteria and give them the correct priority in the decision. In the fourth step the decision-maker will have to generate possible alternatives to resolve the problem. Once the alternatives have been generated, the decision-maker needs to critically analyze and evaluate them, which is done in step five. Finally in the last step, the alternatives will be evaluated against the weighted criteria and the best matching alterative will be selected (Kao & Kao 2007). This model informed the breakdown of decision supply chain processes into: inventory management decisions, location decisions, layout decisions and technology decisions.

2.3.5. Communication Processes

Effective communication between downstream users and suppliers at all stages in the process helps to ensure that relevant information is provided in the supply chain. When downstream users provide information regarding their uses and conditions of use to their suppliers, registrants can base the exposure scenarios in their chemical safety assessment on this information. Consequently, the advice on safe use that the registrant communicates to downstream users is likely to be relevant and realistic. If communication is limited, so is the ability of the procurement department to influence the end to end procurement process (Das et al, 2004)

According to Cutting-Decelle et al (2007) supply chain communication is bound on one end by suppliers' communication with the firm, and on the other end with customers' communication with the firm. Within these two boundaries are the industry communication and the internal communication. Industry communication focuses on the communication between the firm and its competitors as well as other players in the industry influencing its overall position, while internal communication refers to communication within the firm. The four categories of communication must be clearly defined and well coordinated in order to ensure the effectiveness and efficiency of the supply chain communication process. This presentation helped to breakdown the communication supply chain processes into: supplier communication, customer communication, internal communication and competitor communication.

2.3.6. Performance Measurement

Performance is conceptualized on the basis of a supply chain to meet constantly changing end customer demands in terms of costs, productivity, timeliness and quality. In order to achieve this objective supply chains must attract and retain resources that enable quick adaptation and evolution. Supply chains must find some sort of equilibrium between these indicators or find new ways of being competitive. For the conceptualization of performance the following assumptions are proposed: supply chains are technical in nature; supply chains are dynamic and constantly changing; supply chain exhibit similarities; performance is based on interaction along the supply chain and lastly; performance is evaluated from where raw materials are sourced to where final products are consumed (Antai, 2011).

The BSC model is a framework or structure created for integrating indicators derived from the strategy. The original model is composed by four perspectives, namely: financial perspective, customer perspective, internal processes perspective, and learning and growth perspective. The BSC can be for the measurement of performance by splitting the measures of timely delivery, product quality, flexibility, costs, productivity,

reliability among other measures within the four perspectives of the BSC (Barber, 2008). The indicators proposed by the SCOR model can be classified within different classes, namely: reliability/quality, responsiveness, agility/timeliness, cost, coordination, productivity and assets (Bigliardi & Bottani, 2014).

2.4. Empirical Literature Review

2.4.1. Primary Processes outsourcing

Mohiuddin and Su (2013) conducted a study titled manufacturing small and medium size enterprise's offshore outsourcing and competitive advantage. The main objective of this research was to get an in-depth understanding on influences and effects of SMEs off shoring to these firms in terms of competitive advantage. They adopted a qualitative multiple case study approach for the study. They found out that offshore outsourcing has contributed significantly to overall competitiveness for ten out of thirteen firms. Comparatively lower competitiveness for high-tech firms can be explained by the lower rate of their off shoring. However, all of these firms improved their competitiveness in various degrees. They conclude that that off shoring is not only about cost cutting but also about accessing expertise and a growing number of highly skilled and qualified workers.

Waugh and Luke (2011) conducted a study in South Africa titled logistics outsourcing by manufacturers in South Africa. The main objective of the study was to discuss the practices identified in the literature related to the recommended logistics outsourcing process. The research utilized a questionnaire, and discussions with members of industry, mostly in the form of informal interviews. They found out that ensuring the success of an outsourcing project must therefore include the identification and management of potential problems, since the more planning undertaken around the risk factors before implementation, the higher the probability of success. They conclude that logistics outsourcing presents an area in which these organisations can improve customer service and reduce costs.

Kilasi, Juma, & Mathooko (2013) conducted a study on the impact of outsourcing of logistics on the performance strategy of East African Breweries Limited. The study sought to determine the impact of the outsourcing of logistics on the competitive advantage strategy of East African Breweries limited. The study considered case study as the suitable research method to be used. The target population for this study was employees working with East Africa Breweries at their Head office in Nairobi. Purposive sampling was applied in carrying out the study. Data was collected using document reviews, check lists, interviews and questionnaires. Analysis was done using Microsoft's Excel program. The study found that the outsourcing of importation and inbound logistics has an impact on EABL's performance strategy. The study also concludes that the outsourcing of Import and inbound affects the performance of EABL to a great extent. The study found that the outsourcing of Warehousing Logistics has an impact on the competitive advantage strategy of EABL.

Kilasi et al.'s (2013) study also concludes that the outsourcing of Warehousing Logistics affects the performance of East African Breweries to a great extent. The study recommends training the procurement personnel on the best outsourcing procedures in transport logistics, centralizing the transport logistics outsourcing activities and establishing a schedule for each and every job in order to avoid delays.

2.4.2. Secondary Processes Outsourcing

Gilley, Greerband and Rasheed (2004) conducted a study titled human resource outsourcing and organizational performance in manufacturing firms. The objectives of the study were to shed light on the relationship between outsourcing and firm performance by testing the relationship empirically. Surveys were mailed to the heads of 558 firms that were listed in a directory of manufacturers from a single southwestern state. They found out and concluded that payroll outsourcing has a positive influence on firm performance.

Fritsch, Hackethal, Wahrenburg and Wüllenweber (2007) in a study titled the impact of outsourcing on firm performance and governance utilizing a longitudinal survey research design based on an analysis of 137 outsourcing ventures at 254 German banks in a period between 1994 and 2005. Their objective was identification of the impact of BPO on firm performance. They found that the outsourcer's financial performance in terms of profitability and cost efficiency was increased significantly compared to industry peers. They conclude that the outsourcer's financial performance in terms of profitability and cost efficiency was increased significantly compared to industry peers without outsourcing.

Loukis and Arvanitis (2011) conducted a study titled outsourcing and firm performance –a comparative study of Swiss and Greek firms. Their objective was analyzing the factors determining the firms' propensity to outsource various processes determining the impact of outsourcing on firms' innovation performance as well as labour productivity. They found that the productivity effects seem to be considerably weaker than the innovation effects. Outsourcing activities tend to enhance innovation, particularly process innovation, but only weakly directly productivity; the productivity effects seem to be intermediated (at least for Switzerland) by R&D investment in new products and processes. They conclude that intensive use of ICT is important for the outsourcing of ICT and R&D in Switzerland but not in Greece.

Fapohunda (2013) conducted a study in Nigeria titled towards successful outsourcing of human resource functions. This study aimed at establishing some of the attractions and challenges of outsourcing human resource functions. The paper adopted a descriptive research design. It was found out that the effects of outsourcing are contingent on factors like focus on core competencies; make or buy decision, clarity about outsourcing needs, gaining full support and cooperation from employees, training courses and seminar sessions. They found that outsourcing increases profit levels, market share and customer satisfaction but must be carefully handled, so as to not allow diminishing returns to set in. This paper concludes that the human resource outsourcing policy of

any organization has implication on its job performance. Outsourcing is a strategic tool that can be used as a business survival strategy. It can be effective in fighting competition and maintaining competitive edge.

Mukiri (2011) conducted a study titled factors influencing outsourcing of services in selected state corporations in Kenya. The purpose of the study was to find out factors that influence outsourcing of services in some selected State Corporations in Kenya. The study was guided by the objectives of identifying the factors that influence outsourcing of services and to establish the benefits derived from outsourcing of services. A descriptive study design was adopted, using convenience sampling design. Primary data was collected by use of a structured questionnaire with mainly closed-ended questions while secondary data was obtained from organizational reports and data to supplement the primary data. The study findings show the major benefits derived from outsourcing of services include introduction of workforce flexibility; the problem of managing industrial relations is minimized; reduced cost increased efficiency; and focus on core competencies. It is recommended that the practitioners in outsourcing and supply chain management improve ways to manage buyer and seller relationships so that value can be appropriated more effectively by buyers from their suppliers. There is also need for practitioners to understand the attributes of power that provide opportunities for buyers or sellers to have effective leverage over others in business relationships.

2.4.3. Steering processes outsourcing

Hou (2013) conducted a study titled an examination of facilities management service outsourcing relationships. The objective of the study was to examine the factors affecting facilities management outsourcing relationships. A qualitative research approach has been adopted for this study. Findings reveal that trust, openness, flexibility, coordination, cooperation and integration are significantly reflected in the interviews with facilities management managers. The manifestation of relationship factors is correlated with each other. It is found that trust, openness and flexibility manifest themselves through the process of coordination, cooperation and integration.

Ogungbemi (2010) conducted a study titled growth in outsourcing facilities management services: United Kingdom and Nigeria. The main objective of the research was to identify the growth, importance and future trend of outsourcing with reference to the UK and Nigerian markets. It was found out that outsourcing is undertaken to enable them concentrate on core business. It is concluded that facilities management outsourcing leads to there is an increased interaction between sectors. Such interrelationship and dependence creates a stronger core for the economy which will promote the integration of different sectors and services leading to better delivery and economies of scale.

Maku and Iravo (2013) conducted a study titled the effects of outsourcing on organizational performance at Delmonte Kenya Limited. This research discussed the effects of outsourcing of noncore steering activities such as security on organizational performance at Delmonte Kenya limited. The target population of the study was 250 employees who are in management levels in the company. A sample size of 70 employees was used in the study. Random and systematic sampling was used in selecting the respondents. The data was analyzed using descriptive data analysis through computer based SPSS. The finding shows that outsourcing has enabled the company to have greater access to modern technology and expertise. Statistically the main findings

of the study were that outsourcing has helped improve the organizations performance. The study recommends that the organizations should outsource more if not all their noncore activities to the as a major strategy of remaining competitive.

Njambi and Katuse (2013) conducted a study on third party logistics in distribution efficiency delivery for performance in fast moving consumer goods companies in Kenya. The authors' aim was to undertake a comparative study on how using third party logistics can deliver distribution efficiency and its contribution to performance for organizations. The study adopted a descriptive research design with a sampling frame of fifty companies operating in Kenya. Primary data collection method was used through mail questionnaire. Data was analyzed using SPSS package version 14. Results based on the analysis of data relating to fifty Companies in Kenya showed that the use of third party model is effective in enhancing delivery of products to the customers premise, maximizing their revenue from the use of third party logistics and improving customer performance in meeting consumer needs. The study recommends firms should take advantage of opportunities provided by 3PLs to address organizational needs.

2.4.4. Decision processes outsourcing

Koh and Demirbag (2007) conducted a study titled: the impact of supply chain management practices on performance of SMEs. The purpose of this study was to determine the underlying dimensions of SCM practices in Turkey, key among which was outsourcing of inventory management. A survey design was used. Data for this study was collected using a self-administered questionnaire that was distributed to 800 SMEs operating in the manufacture of fabricated metal products and general purpose machinery within the city of Istanbul in Turkey. The findings of the study were that increasingly a majority of firms are adopting the outsourcing of inventory management in order to reduce their costs, gain flexibility and improve performance. They conclude that even though firms may be reluctant to adopt inventory management outsourcing consideration should be given to the potential benefit compared to implied and explicit risks.

Dzogbewu, (2010) conducted a study titled the outsourcing of logistical activities: the case of Guinness Ghana Breweries Limited. The general objective of the studies is to investigate how decisions are made regarding outsourcing of logistical activities in most effective and efficient way. The case study methodology was used. The data collected from the field was analyzed using Microsoft Excel to plot bar charts and pictorial diagrams. Secondary data was obtained from relevant published reports written on outsourcing logistics activities operations and related materials. The study revealed that Guinness Ghana Breweries Limited has been outsourcing its inventory management activities for more than four years. The rationale behind the outsourcing activities was to cut down cost and enjoy first class service from specialist using the most suitable, quick and reliable technology. The company has actually increased its revenue margin consistently for the past four years and has enjoyed other benefits like: timely delivery and overall quality improvement. It was concluded that the most obvious reason behind outsourcing logistics activities is to provide very effective means of reducing costs, better services, improving operating efficiency, flexibility and getting access to new suitable technologies easily at a lower cost.

Mulama (2012) conducted a study titled logistics outsourcing practices and performance of large manufacturing firms in Nairobi. The objective of the study was to determine logistics outsourcing practices and performance of large manufacturing firms in Nairobi Kenya. The research was a cross sectional survey of the large manufacturing companies operating in Nairobi, Kenya. The study used primary data which was collected through a self-administered questionnaire that consisted of both open and closed ended questions. The data was analyzed using descriptive statistics. The finding of the study was that the outsourcing services adopted by the firms were transportation management, warehouse management, inventory management, material handling management, information management and inventory management.

Mulama (2012) concluded that the outsourcing practices being adopted by the firms resulted in increased productivity, organizational effectiveness, increased profits, continuous improvement, improved quality and improved quality of work life and thus outsourcing of these processes was an ideal solution that helps the firm expand internationally and operate on a much larger scale. At the same time, outsourcing resulted in decreased operating costs, improved customer satisfaction, increased productivity, timely delivery of services to clients, reduced lead time, improved profits and faster response to customer demands. This was an indication that the performance of the firms was influenced by the outsourcing practices adopted by the firms.

2.4.5. Communication Processes Outsourcing

Möhlmann and de Groot (2010) conducted a study titled the effects of outsourcing on firm productivity; evidence from micro data in the Netherlands. This study uses a survey approach that explicitly asks firms about their outsourcing activities. The study found out that communication was one of the outsourced activities by firms. The most important motive for outsourcing internationally seems to be a reduction of labour costs. Other important motives are improving logistics, strategic decisions, and reducing other costs than labour costs. They conclude that outsourcing of communication ultimately results in improved communication efficiency and effectiveness, reduced communication costs and better coordination of communication activities.

Naidoo and Neville (2013) conducted a study in South Africa titled current situational analysis of the call centres / BPOs sector in the Western Cape. The purpose of this study was to identify and recommend policies on BPO. The approach was to use desk research on the local sector. They found out that businesses outsource their communication processes in order to: - lower costs, resulting in improved capital and labour productivity; access to more effective business processes that will improve their own service and competitiveness; access to scarce resources through the supplier's own resource base access to dedicated world-class technology; predictable cost streams.

Musangi (2013) conducted a study titled strategy, firm characteristics, business process outsourcing and performance of Kenyan state corporations. The study's general objective was guided by the fact that there has been a lack of established consensus on the actual end effect of outsourcing. This research was a census study focusing on all the 144 State corporations in existence by December 2012. The study managed to get participants from 112 State corporations drawn from all the six functional classes as per the existing categorization. Both primary and secondary data were used for analysis in the study. The primary data was obtained from the information in the questionnaires distributed to the State corporations whereas the secondary data was retrieved from existing reports from the office of the Auditor General and the Performance Contracting department. The study employed a combination of both descriptive and inferential statistics. The findings of this study confirmed that all the Kenyan State corporations were involved in outsourcing, and that BPO had a positive contribution to the firms' overall performance.

2.5. Critique of Empirical Literature

Mohiuddin and Su (2013) come close to the aspect of determining the improvement of performance by manufacturing firms consequent to outsourcing. However their study focuses on manufacturing SMEs and furthermore it is based on a developed country; Canada. This is unlike Kenya in many respects. Another deviation point of their study from this one is that their focus was on offshore outsourcing of manufacturing while this study aims at focusing on domestic outsourcing by manufacturing firms. They also focus on manufacturing only while ignoring other supply chain activities whose outsourcing may equally lead to the improvement of performance. In addition they adopted a qualitative case study whose objectivity is questionable (Yin, 2009). Finally their dependent variable was competitive advantage as opposed to performance.

Waugh and Luke (2011) adopted a literature review approach to their study which made for poor empirical contribution in the study. They did not focus of performance as the dependent variable but laid more emphasis on customer service as their dependent variable while logistics outsourcing was their independent variable. The study only focused on one area of primary supply chain processes as opposed to the overall supply chain processes outsourcing. In addition their study was based in South Africa, a country considered to be highly different from the rest of her sub-Saharan counterparts, including Kenya.

Kilasi et al., (2013) also deal with the aspect of primary supply chain activities outsourcing although in an implied manner by focusing on logistics outsourcing. In addition to limiting themselves to only one area of primary supply chain activities they also adopt a case study approach of EABL, a firm whose findings may not be applicable to other manufacturing firms operating in a competitive environment since the firm's large size more or less makes it a monopoly in the organized alcohol market in Kenya. Therefore the improvement of performance may not be adequately analyzed in light of EABL. In addition the study focused on competitive advantage as opposed to focusing on performance.

Gilley et al., (2004) limit themselves to only one area of the secondary supply chain processes, that is, HR outsourcing. This single function may not be sufficient to adequately conclude on the effect of secondary processes outsourcing the improvement of performance. In addition their study is also focused on a developed country whose circumstances may not be replicated in a developing country such as Kenya. Fritcsh et al., (2004) lay emphasis on BPO. While some secondary supply chain activities do fall in the realm of BPO. This term is too vague for technical application in the field of supply chain management. Their study also focuses on the banking sector and more so in one of the most developed countries in the world; Germany. In addition they fail to explicitly bring out the aspect of performance creation and this can only be deduced from their conclusion on improved financial performance and profitability.

Fritsch and Hackenthal (2008) conducted their study on German firms which provides a wide contextual difference from Kenya. In addition they focused on BPO rather than supply chain processes outsourcing. They also focus on the general firm performance rather than the performance of the firm. Loukis and Arvantis (2011) emphasise on the general outsourcing by Swiss and Greek firms and its effect on their performance and innovation. There focused on overall firm performance, rather than the distinct area of performance. While Greece and Switzerland are different in their economic context from Kenya, this study also does provide a clear boundary on the type of firms it focuses on. Even though their study also identifies the motivation for outsourcing they also fail to provide a clear picture on the effect of outsourcing on the performance.

Fapohunda (2013) focuses on Nigeria which though similar to Kenya in a number of respects, is different from the Kenyan context especially in terms of demographics. The study also adopts a descriptive research design which is not conclusive in determining the effect of one variable on another (Jalil, 2013). The study also focuses on only one activity of secondary supply chain processes outsourcing. In addition, the study focuses on only the area of general firm performance, and not on performance.

Mukiri (2011) focused only on the outsourcing of services for state corporations in Kenya. This deviated from the focus of this study which manufacturing of supply chain processes by manufacturing firms. In addition he adopted a descriptive research design which may not be sufficient in obtaining conclusive evidence of a relationship between the variables of concern. Hou (2013) focused only on the facilities management and not on the entire supply chain processes. This study was also qualitative, subject to the shortcomings of bias and prejudice due to its opinionated nature. The study also focused on general performance of the firm rather than isolating the performance component of the firm performance. Ogungbeni's (2010) study deviates from the Kenyan context by focusing on both Nigeria and the United Kingdom. In addition the study looks at the growth, opportunities and trends in outsourcing in the two countries relative to the general firm performance and not on the effect on performance consequent to

outsourcing. The study also focuses on general firms without a distinction on the basis of operations or industry, unlike this study which isolates manufacturing firms as its target.

Maku and Iravo (2013) provide a Kenyan context of steering processes outsourcing and the improvement of performance, albeit focusing on general outsourcing. Their study also veers off the course of manufacturing and moves on to the agricultural processing industry. They ignore majority of the supply chain processes and focus on steering supply chain processes. They focus on general firm performance rather than isolating the performance of the firm. The case study approach adopted for this study cannot be conclusive in relation to all firms currently operating in Kenya.

Njambi and Katuse (2013) focused on the improvement of performance by outsourcing of logistics to 3PLs. however their study is in the FMCG sector and only focuses on logistics especially on the creation of effective co-ordination and effective planning, with a respondent base of 50 firms. By focusing on only two activities their study cannot be conclusively provided as an indicator of how steering processes outsourcing leads to the improvement of competitive especially in the manufacturing sector. The approach adopted for the study is also inadequate of providing conclusive data suitable justifiable conclusive evidence.

Koh and Demirbag (2007) focus on supply chain management performance rather than supply chain processes outsourcing and more so on decision supply chain processes outsourcing with a focus on inventory management. Their study is also on general SMEs without distinction of the nature of operations. Dzobegwu (2010) focused only on logistics and adopted a case study approach of Guinness Ghana Breweries Ltd. This deviated from this study in that it focused only on one primary supply chain process outsourcing and also the adoption of a case study which does not provide a good basis for concluding on a large number of subjects (Greener, 2008). The study also failed to focus on performance as the dependent variable opting to focus on overall firm

performance. Mulama (2012) opted for the focus of logistics outsourcing and the general firm performance rather. While it adopted the appropriate cross sectional survey, it focused only on large manufacturing firms thereby leaving out other categories of manufacturing firms. It adopted descriptive statistics which may not be appropriate for drawing conclusions.

Möhlmann and Groot (2010) focus only on productivity as a consequence of outsourcing communication thereby avoiding the entire supply chain processes outsourcing and performance. Naidoo and Neville (2013) study focuses on literature review therefore lacking empirical evidence of the conclusion. In addition their focus is on call centres in South Africa which is contextually different from manufacturing firms in Kenya.

2.6. Research Gaps

From the critique of literature review provided in the preceding section, it is evident that the effect of supply chain processes outsourcing on the performance of manufacturing firms has yet to be conclusively empirically determined in Kenya. It is evident that studies on the subject of outsourcing on the performance have primarily focused on an incomplete study of the entire spectrum of supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The studies especially on Kenya have focused on a single aspect of the supply chain processes outsourcing. In these studies the manufacturing sector has largely been ignored. Studies on the subject of supply chain processes outsourcing, in its entirety, in Kenya are almost non-existent as most have focused on individual supply chain activities.

The aforementioned studies have glaring deviations from this topic, due to their focus on individual supply chain functions as well the methodology adopted in pursuing the objectives of the study (Kilasi & Juma, 2013; Maku and Iravo, 2013), rather than focusing on the entire supply chain, hence the research gap which this study intends to

fill. This research is intended to fill the gap of inadequate information and understanding that exists in relation to the supply chain processes outsourcing on the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya. As reflected by the presented theoretical and empirical literature there is an inadequacy of research findings on the effect of supply chain processes outsourcing leads on the performance of manufacturing firms in Kenya.

2.7. Summary of the Literature Review

This chapter has reviewed extensively the literature on the subjects of supply chain processes and their outsourcing. The chapter established that supply chain processes can be categorized into five main categories as described by Kleijn and Rorink (2012). It is upon this classification that this study is based. In determining the specific activities that fall in each category the study utilized various theories and framework that have been developed to specify the activities in each category such as the value chain model (Porter, 1985) or the SCOR model (SCC, 1996) among others. From these theories the study developed a conceptual framework showing the relationship between the independent variable and the dependent variable.

The study delved into empirical literature review where it analysed past studies in the field of the effect of supply chain processes outsourcing on the performance of firms in various industries. This review was conducted using a funnel approach starting from the global perspective, the African perspective and closing with the local (Kenyan) perspective on all the five categories of supply chain processes. This was followed by a critique which showed that the empirical link between supply chain processes outsourcing and performance had not been clearly established as was explained in the subsequent research gaps in order to facilitate the a deeper understanding of the research problem and provide adequate information for the development of an appropriate research methodology as discussed in chapter three.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter details the research methodology that was adopted by the study. The research methodology outlines how the study will search the given question systematically to find out all the answers till conclusion. If research methodology is not clearly defined, there would be less possibility to find out the final result. A lot of research problems can be effectively resolved by using the correct research methodology (Industrial Research Institute, 2010). This chapter is organized as follows: It specifies the research design adopted for this study, the population, the target population, sampling frame, sampling technique and sample size, data collection instruments, data collection procedure and ends with data analysis.

3.2. Research Design

Yin (2009) states that a research design is the blue print of the study. The function of a research design is to ensure that the evidence obtained enables us to answer the initial question as unambiguously as possible. There is lack of consistency in classification of different types of research designs. Some classify based on the type of research question being addressed (exploratory, descriptive etc.), others focus on the data collection tools; survey; quantitative; qualitative (Jalil, 2013).

This study adopted a cross sectional survey research design. A cross sectional survey is oriented towards the determination of the status of a given phenomenon at given point in time rather than towards the isolation of causative factors accounting for its existence (Singh, 2006). Cross sectional survey research design was chosen by the study since the aim of the study is to examine the existence and magnitude of causal effects of independent variables upon a dependent variable of interest at a given point in time for manufacturing firms in Kenya.

3.2.1. Research Philosophy

A research philosophy is a belief about the way in which data about a phenomenon should be gathered, analysed and used (Bryman & Bell, 2011). According to Orucho (2014) scholars in social sciences posit that empirical research is dominated by positivism and phenomenology or interpretivism research philosophies. The positivistic philosophical approach is quantitative and dominated by the process of hypothesis testing. It is based on objectivity, neutrality, measurement and validity of results. Phenomenological approach is qualitative in nature and focuses on the researcher's perception and relies on experience and avoids generalisation based on an existing theory. This research was guided by the positivist research philosophy due to the fact that it aimed at quantitatively and objectively examining the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya.

3.3. Population of the Study

Saunders, Lewis and Thornhill (2012) state that a population is the total of all the individuals who have certain characteristics and are of interest to a researcher. Population in research is either finite or infinite. That is, containing a countable number of elements or an uncountable number of elements, respectively. The population for this study was all the manufacturing firms in Kenya.

The target population is a segment of the entire population that meets a particular characteristic which the study intends to study in order to make inference on the whole population (Bryman & Bell, 2003).The target population for this study was all the manufacturing firms operating in Nairobi's Industrial Area. This target population was chosen for the study since due to the fact that Nairobi's industrial Area has the highest concentration of manufacturing firms in Kenya (KNBS, 2013). This high concentration of firms, whether in direct or indirect competition, in a given locality makes them highly adoptive of and adaptive to innovations in order to improve their relative overall performance (Strange, 2011). Therefore these firms in Nairobi's industrial area are

most likely to have adopted the most recent innovations and trends in supply chain management such as supply chain processes outsourcing and hence provide a suitable population for the study.

3.4. Sampling Frame

Särndal, Swensson and Wretman (2003) state that in research, a sampling frame is the source material or device from which a sample is drawn. It is a list of all those within a population who can be sampled, and may include individuals, households or institutions. The sampling frame for this study was all the manufacturing firms operating in Nairobi's industrial area. The list of all these firms is presented in Appendix 3: List of Manufacturing Firms comprised of 358 firms.

3.5. Sampling Technique and Sample Size

Sampling methods are classified as either probability or non-probability. In probability samples, each member of the population has a known non-zero probability of being selected. Probability methods include random sampling, systematic sampling, and stratified sampling. In non-probability sampling, members are selected from the population in some non-random manner. These include convenience sampling, judgment sampling, quota sampling, and snowball sampling (Bryman & Bell, 2011).

Simple random sampling was adopted for this study in selecting the respondents. The sample captured 30% of members of the sampling frame to comprise the sample. Gall, Gall and Borg (2003) advocate that at least 30% of the total population is a representative sample. KNBS (2013) indicates that there are 358 manufacturing firms in this area. This is the highest concentration in any geographical zoning in Kenya. The sample for the study was obtained as shown in Table 3.1.

Table 3. 1: Sample Size

Industry	Total Number of Firms	Sample size (30%)
Human and animal food products	88	26
Tobacco, alcohol and soft drinks	26	8
Textiles, leather products and accessories	62	19
Wood, wooden products, rubber and paper products	37	11
Petroleum products, chemicals and fertilizers	20	6
Glass and Plastics	15	5
Detergents, pesticides and pharmaceutical products	19	6
Cement, concrete, iron and steel products	34	10
Electronics and electric products	19	6
Motor vehicles, motor vehicle parts and other machinery	38	11
Total	**358**	**108**

3.6. Data Collection Instruments

This research utilized a structured questionnaire to collect data. The questionnaire was divided into six sections. The first section focused on personal and professional aspects of the respondents while the other five sections each focused on a single research objective. Annum (2014) states that a questionnaire is a form or document with a set of questions deliberately designed to elicit responses from respondents or research informants for the purpose of collecting data or information. Structured questionnaires are those in which some control or guidance is given for the answer.

3.7. Data Collection Procedures

Jalil (2013) states that data collection procedures specify the process of data collection. Data can be classified into primary and secondary data. Primary data is information that is collected directly from the field specifically for the purpose of a research project (Salant & Dillman, 1994). Secondary data is the data that has been already collected by and readily available from other sources (Yin, 2009). In relation to the data collection procedure the study developed a timetable for data collection and scheduled appointments with the respondents, specifying in detail the date, time and place where the data was to be collected. The unit of analysis in this study is the manufacturing firm. Since the study is majorly based on supply chain processes outsourcing effect on performance, the target respondents were the officers in charge of supply chain management or its equivalent.

3.8. Pilot Study

The term pilot study is used in two different ways in social science research. It can refer to so-called feasibility studies which are small scale versions, or trial runs, done in preparation for the major study. However, a pilot study can also be the pre testing or trying out of a particular research instrument. A pilot study might give advance warning about where the main research project could fail, where research protocols may not be followed, or whether proposed methods or instruments are inappropriate or too complicated (Baker, 2014). The questionnaire was pilot tested on 10% of the members of the sampling frame who did not comprise the final sample. These were 36 firms. The responses obtained from this pilot study were used to determine the discrimination, validity, reliability and multicollinearity of the questionnaire after which the relevant amendments were made to the questionnaire. According to Field (2004) discrimination of a questionnaire means that people with different scores on a questionnaire, should differ in the construct of interest to the study.

3.8.1. Reliability

According to Field (2004) reliability is the ability of the questionnaire to produce the same results under the same conditions. To be reliable the questionnaire must first be valid. The most commonly used measure of scale reliability was developed by Cronbach and Meele (1955) who suggested that the data should be split into two in every conceivable way and correlation coefficient computed for each spilt. The average of these values is known as Cronbach's Alpha, which is the most common measure of scale reliability. A value of 0.8 and above is seen as an acceptable value for Cronbach's alpha; values substantially lower indicate an unreliable scale (Brown, 2014).

3.8.2. Validity

According to Breakwell, Hammond & Fife-Shaw (2012) validity basically means that a questionnaire measures what it is intended to measure. According to Greener (2008) Validity is a difficult thing to assess and it can take three basic forms: content validity- items on a questionnaire must relate to the construct being measured; criterion validity- this is basically whether the questionnaire is measuring what it claims to measure and thirdly; factorial validity- this validity basically refers to whether the factor structure of the questionnaire makes intuitive sense. Validity is a necessary but not sufficient condition of a questionnaire (Baker, 2014).

3.8.3. Multicollinearity

Multicollinearity is a case of multiple regression in which the predictor variables are themselves highly correlated. There are four primary sources of multicollinearity: the data collection method employed; constraints on the model or in the population; model specification; an over defined model. The presence of multicollinearity has a number of potentially serious effects on the least squares estimates of the regression coefficients the most significant of which is leading to the acceptance of the null hypothesis more readily (Paul, 2006).

Multicollinearity diagnostics are conducted using VIF and tolerance statistic. The VIF is the reciprocal of the tolerance statistics. The VIF for each term in the model measures the combined effect of the dependences among the regressors on the variance of that term. One or more large VIF indicate multicollinearity. Tolerance is the opposite of the coefficient of determination (R^2). Tolerance is estimated by 1 - R^2. All other things equal, researchers desire higher levels of tolerance, as low levels of tolerance are known to affect adversely the results associated with a multiple regression analysis. A VIF of greater than 5 is generally considered evidence of multicollinearity. While a tolerance statistic of less than 0.20 is also taken as a course for multicollinearity concern Beckstead 2012).

3.9. Data Analysis

Academy for Educational Development (2006), states that data analysis can refer to a variety of specific procedures and methods. Data analysis involves goals; relationships; decision making; and ideas, in addition to working with the actual data itself. Simply put, data analysis includes ways of working with data to support the goals and plans of research. Data analysis can be categorized into descriptive (describes a set of data); exploratory (analyzing data sets to find previously unknown relationships); inferential(use a relatively small sample of data to say something about a bigger population); predictive (analyze current and historical facts to make predictions about future events); causal (To find out what happens to one variable when you change another); mechanistic (Understand the exact changes in variables that lead to changes in other variables for individual objects).

The study adopted descriptive data analysis and inferential data analysis. Descriptive data analysis has been adopted for this study because descriptive analysis is used to describe the basic features of the data in a study. It provides simple summaries about the sample and the measures. Together with simple graphics analysis, they form the basis of virtually every quantitative analysis of data (Adèr & Mellenbergh, 2008). . The study

adopted inferential data analysis in order to enable it reach conclusions that extend beyond the immediate data alone to infer from the sample data about the population. Inferential statistics facilitate inferences from sample data to population conditions (Vance, 2011). The study used SPSS version 20 and MS Excel to facilitate the analysis of data. SPSS was used to undertake calculations on the data. The study utilized SPSS to develop a multiple regression model to make inferences on the effect of each of the independent variables on the dependent variable. Illustrative data representation devices and tools were adopted to diagrammatically represent and analyse the data. The regression model took the form of:

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

Where:

Y= performance

β_0= Y intercept

X_1= Primary processes

X_2= Secondary processes

X_3= Steering processes

X_4 = Decision processes

X_5 = Communication processes

ε= Error term

β_1, β_2, β_3, β_4 and β_5 represent the coefficient of each independent variable. These coefficients indicate the value of the respective dependent variable when the independent variable is equal to zero.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1. Introduction

This chapter presents the findings of the study. The analysis was done using statistical package for social sciences (SPSS) version 20 and MS Excel 2010. This chapter presents the results of the pilot test in terms of validity reliability and multicollinearity, and then progresses on to the descriptive and inferential analysis of each independent variable relative to the dependent variable. Eventually, closing with a multi-linear regression model development, an optimal regression model and a revised conceptual framework.

4.2. Response Rate

Out of the administered 108 questionnaires, 104 were returned fully completed while 4 were retuned either incomplete or spoilt in a manner that rendered them incomprehensible and incapable of analysis. The incomplete questionnaires were discarded from the analysis process while the completed questionnaires were taken for analysis. These 104 questionnaires represented a response rate of 96% and a non response rate of 4%. This response was deemed adequate for further analysis in line with the recommendations of Fan & Yan (2010) who state that a response rate of 80% and above is adequate for further analysis in face to face administered questionnaires, such as the one used in this study. The response rate is shown in the Figure 4.1.

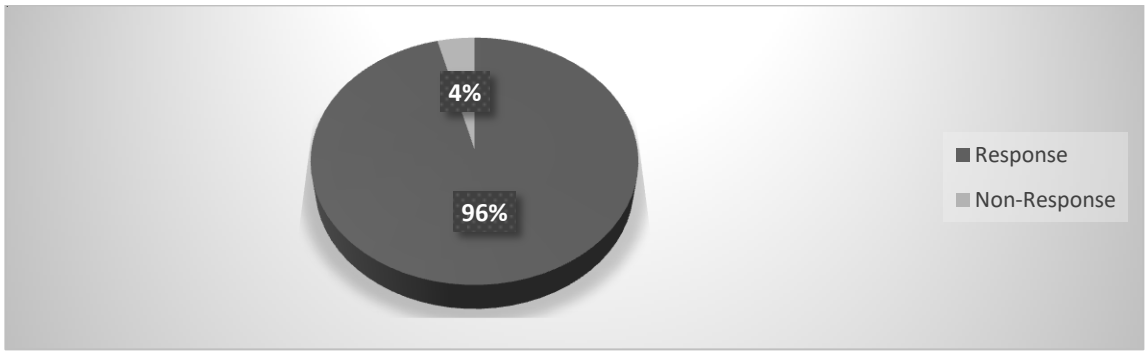

Figure 4. 1: Response Rate

4.3. Pilot Test Results

4.3.1. Reliability of the Instrument

The questionnaire was pilot tested on 10% of the members of the sampling frame making a total of 36 firms. A Cronbach alpha test was conducted to check the reliability of the responses from the pilot test. The pilot test results revealed that the data collection instrument was reliable. All the responses recorded a Cronbach alpha result greater than the minimum 0.800. Brown (2014) states that Cronbach alpha of at least 0.800 implies there is adequate internal consistency reliability of the instrument. These results are shown in Table 4.1.

Table 4. 1: Pilot Test Results

Variable	Number of items	Cronbach (α)
Entire questionnaire	170	0.877
Primary Process outsourcing	28	0.865
Secondary Process outsourcing	33	0.921
Steering process outsourcing	24	0.865
Decision processes outsourcing	33	0.831
Communication process outsourcing	23	0.861
Performance	29	0.852

4.3.2. Validity of the Instrument

Relative to the validity of the instrument, the study used the expert opinion and peer review of the two supervisors and four fellow students respectively who confirmed that the questionnaire was indeed valid in terms of construct discriminant and content validity. Construct validity is used to measure whether the operational definition of variables actually reflect the true theoretical meaning of a concept. Discriminant validity is the degree to which scores on a scale do not correlate with the scores on the other scales defined to measure different constructs. Content validity confirms whether the theoretical dimensions emerge as conceptualized (Orucho, 2014).

4.3.3. Multicollinearity

From the multicollinearity test results in Appendix 4, The highest VIF was 1.414 while the lowest tolerance statistic is 0.707. The VIF and tolerance measures relate to collinearity measure for each independent variable relative to the other independent variables in the study. A VIF of greater than 5 is generally considered evidence of multicollinearity. While a tolerance statistic of less than 0.20 is also taken as a course for multicollinearity concern (Beckstead 2012). From the measures presented in appendix 4, it can be concluded that there was no multicollinearity in the given model.

4.4. Demographic Statistics

4.4.2. Gender of the Respondents

The respondents of the organizations were asked to indicate their gender. The study established that majority 73% of the respondents who work in the manufacturing industry are male whereas 31% of the respondents were of the female gender. The results are presented Table 4.2. This is an indication that there are still gender disparities as far as firm management is concerned with the females being disadvantaged. These findings are in line with the findings of Christophe and Wolff (2009) who found that there are large differences in the sex composition of the manufacturing firms' workforce

in Africa especially in Benin, Kenya, Madagascar, Mauritius, Morocco, Senegal and Uganda. The gender diversity would be appropriate in gathering responses on outsourcing from both genders for this study.

Table 4. 2: Gender of Respondents

		Frequency	Percent	Cumulative Percent
Valid	Male	73	70.2%	70.2%
	Female	31	29.8%	100%
	Total	**104**	**100.0%**	

4.4.3. Average length of service

The researcher quantified human capital on the basis of length of service as an indicator of human capital through human capital categorization, where 0-5 years signified low human capital, of which there were none. 6-10 years signified average human capital. 11-15 years of service represented above moderate human capital and more than 15 years signified high human capital. Most of the employees (63%) had had between 11 and 15 years of work experience. Long serving employees of more than 15 years was 30%. This clearly indicates that the manufacturing sector absorbs a younger, vibrant and energetic workforce that would be capable of responding swiftly to the changes that the external environment presents and the dynamic business environment considering the volatility of this industry. These findings contradict the findings USOPM (2013) which states that of 25% of SES employees have served less than 12.9 years; 75% of SES employees had served more than 12.9 years. This findings are interpreted to mean that the respondent have adequate experience and exposure to provide the appropriate responses to the questionnaire. The findings of this study are represented in Figure 4.2.

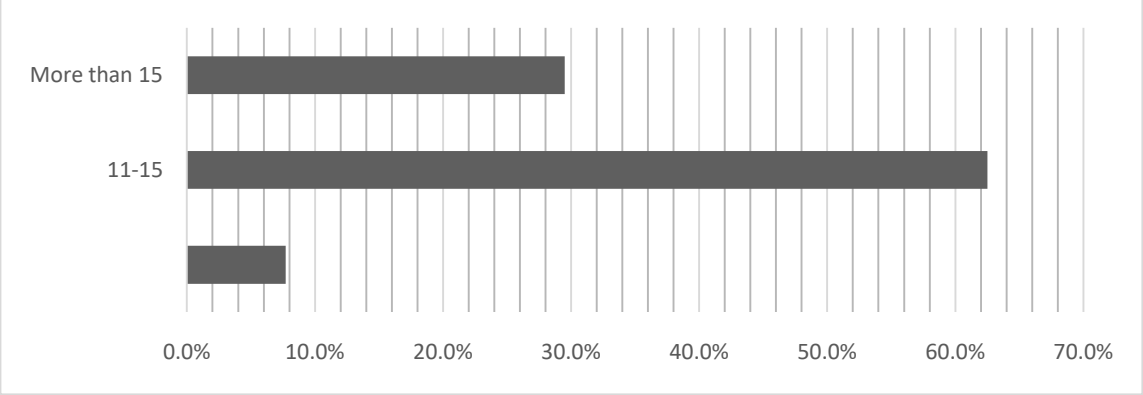

Figure 4. 2: Length of Service

4.4.4. Academic Qualification

The study quantified human capital on the basis of the academic qualifications held by employees as an indicator of human capital through human capital categorization, where certificate signified low human capital, diploma signified average human capital, bachelor's degree signified above average human capital, master's degree and doctorate degree signified high human capital. These findings are shown in Table 4.3. Majority of employees in this sector (61.5%) are bachelor's degree holders. These are the academic qualifications that have been held by majority of employees within the last three years. 17.3% held a diploma degree and 11.5% held a certificate degree respectively; this category was inclusive of CIPS certification. Only 1% of the respondents held a PhD. The academic qualification can therefore be concluded to be moderate. This level of academic qualifications among the target respondents was considered advantageous to the study since this individual had adequate level of academic qualifications necessary to enable them understand the questions in the questionnaire and also to provide the correct responses thereby making the study highly accurate.

Table 4. 3: Academic Qualification

		Frequency	Percent	Cumulative Percent
Valid	Certificate	12	11.5%	**11.5%**
	Diploma	18	17.3%	**28.8%**
	Bachelor's degree	64	61.5%	**90.3%**
	Master's degree	9	8.7%	**99%**
	PhD	1	1%	**100%**
	Total	**104**	**100%**	

4.5. Primary Processes

This section is intended to facilitate the achievement of the following specific objective: To determine the effect of primary processes outsourcing on the improvement of performance for manufacturing firms in Kenya. These section focuses on the four specific functions considered to compose primary functions in this study. These include product development, manufacturing, outbound logistics and inbound logistics. In the questionnaire the study sought the responses regarding the outsourcing of various aspects of primary supply chain processes.

The respondents were required to provide numerical responses (in appropriate units) for each year over a period of five years on the total volume of each activity and numerical responses on the volume of each activity that was outsourced. From these five year responses a simple arithmetic mean was calculated to determine the average volume of the total of each activity and its corresponding outsourced volume. The latter was expressed as a percentage of the former to determine the level to which the activity in question was outsourced. The computed percentages were then categorized into five categories as follows: 0%-20%, 21%-40%, 41%-60%, 61%-80% and 81%-100%. For more effective and efficient analysis each of the categories was assigned a score of 1,2,3,4 and 5 respectively. The general level of outsourcing adoption was determined by calculating the means and standard deviation for the various statements as per the scores and tabulated**.** The findings, related analysis and discussions start at section 4.4.1.

4.5.1 Product development

The study found out that most organization outsourced product prototyping as this parameter had the highest mean score of 3.64. Outsourcing of new product ideas had a mean score of 2.6. The study also established that in the manufacturing industry outsourcing of product launch was not popular as this parameter had the lowest mean score of 2.4. These findings are shown in Table 4.4.

Table 4. 4: Product Development Activities

	N	Minimum	Maximum	Mean	Std. Deviation
New product ideas	104	1	5	2.60	1.057
Product ideas screening	104	1	5	2.62	1.091
Product prototyping	104	1	5	3.64	1.088
Product test marketing	104	1	5	2.71	1.094
Product launch	104	1	5	2.47	1.033
Valid N (list wise)	104				

In relation to the outsourcing of product development 51% of the respondents indicated that its outsourcing would lead to timeliness of supply chain activities. Only 16% of the respondents indicated that its outsourcing would lead to increase in productivity. 14% of the respondents indicated that the outsourcing of new product ideas development would lead to low costs. 48% of the respondents indicated its outsourcing would lead to high product quality. These findings are shown in Table 4.5.

These findings contradict those of Shamsuzzoha, Abdul Malek and Iqbal (2010) who found out that often firms outsourced their product development process in order to manage cost, reduce time-to-market, boost bottom line, achieve better time to market, minimize risks, access the latest technology with comparatively cheaper rate, improve return on their new idea generation investment and save time for core activities. These findings contradict those of Ganguly, Dash, & Bandyopadhyay (2013) who found out

that outsourcing of product development leads to sharing and reallocation of resources, more flexibility in resource management, enabling new product development cycle to be divided into smaller discrete components. This study concludes that outsourcing of product development does not lead improvement of performance.

Table 4. 5: Outsourcing of Product Development

Performance Dimension	Frequency	Percentage (%)
Timeliness	53	51%
Productivity	17	16%
Low costs	14	14%
High product quality	70	68%

4.5.2. Manufacturing activities

The study revealed that organizations in the manufacturing sector outsourced raw material processing as the parameter had the highest mean score of 4.4 and a standard deviation of 0.857. The study ascertained that the rest of processes were outsourced to a low extent as the parameters ranged from 2.46 – 1.99 with conditioning being the least outsourced as shown in Table 4.6. This is indicative that most manufacturing companies do not outsource their major manufacturing activities.

Table 4. 6: Manufacturing Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Raw material processing	104	2	5	4.44	.857
Forming	104	1	3	2.21	.552
Assembly	104	1	4	2.19	.687
Conditioning	104	1	5	1.99	.782
Finishing	104	1	4	2.46	.812
Valid N (list wise)	104				

The respondents, 79% of them, indicated that outsourcing of manufacturing was likely to lead to timeliness. 72% of the respondents indicated that outsourcing of manufacturing is likely to lead to increase in productivity. 91% of the respondents indicated that outsourcing of manufacturing services was likely to reduce cost. This was assumed to be due to large scale operations of the manufacturing agent who maybe servicing a number of clients. 63% of the respondents expressed their opinion that outsourcing of manufacturing was likely to lead to access to high quality products. These findings are shown in Figure 4.3.

These findings confirm those of Mulama (2012) who found that manufacturing outsourcing practices adopted by the firms resulted in increased productivity, organizational effectiveness, increased profits, continuous improvement, improved quality and improved quality of work life. These findings contradict those of Benit (2008) who found out that outsourcing of manufacturing has no significant impact on the performance of a firm. These findings reflect those of Kroes and Ghosh, (2009) who found out that outsourcing provider may be able to provide higher performance quality, lower labor costs, less government regulation and lower overhead costs. This study concludes that outsourcing of manufacturing does lead to the improvement of performance for manufacturing firms.

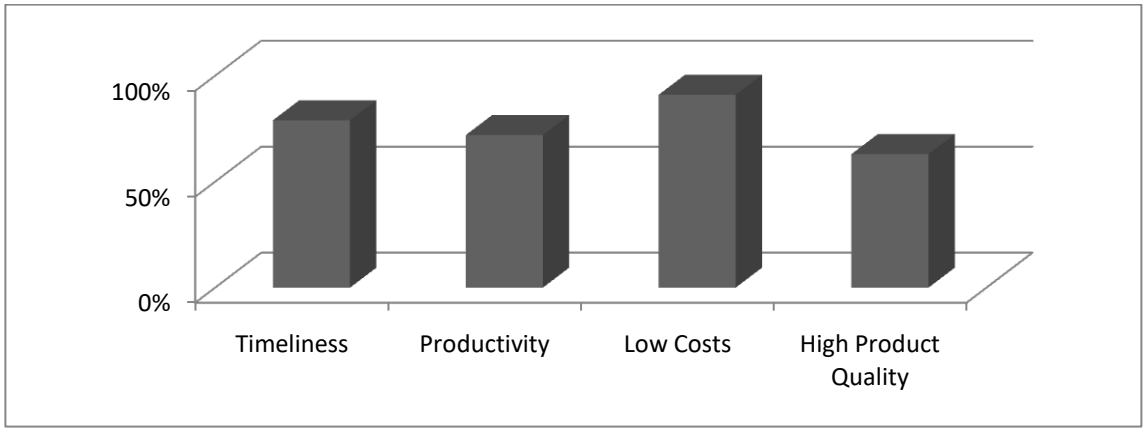

Figure 4. 3: Outsourcing of Manufacturing

4.5.3. Out-Bound Logistics

The parameter with the highest mean score in outbound logistics outsourcing was carrier selection and routing outsourcing which had a mean score of 3.18. Equipment selection and finished goods Warehousing had mean scores of 2.98 and 2.9 respectively. These findings reveal that most manufacturing companies prefer to outsource out outbound logistics moderately. This is evident from the mean scores of about 3.0. These findings are shown in Table 4.7.

Table 4. 7: Out-Bound Logistics

	N	Minimum	Maximum	Mean	Std. Deviation
Setting customer service level and standards	104	1	5	3.02	1.140
Finished goods Warehousing	104	1	5	2.90	1.102
Carrier selection and routing	104	1	5	3.18	1.172
Equipment selection	104	1	5	2.98	1.254
Valid N (list wise)	104				

In relation to the outsourcing of outbound logistics, 16% of the respondents indicated that it would lead to timeliness. 71% of the respondents indicated that its outsourcing would lead to increase in productivity. 92% indicated that its outsourcing would lead to reduced costs since the costs associated with it will have been transferred to the outsourcing agent. 84% of the respondents indicated that outsourcing of outbound logistics would lead to high quality. These findings are represented in Table 4.8. These findings corroborate those of Rouse (2011) who found out that outsourcing of outbound logistics did improve cost and service outcomes. These findings are also in line with those of Kilasi, Juma and Mathooko (2013) who found that outsourcing of distribution logistics at EABL helps the firm focus resources on revenue-generating activities and offload processes outside their core competencies. This study concludes that the outsourcing of finished goods warehousing results in improvement in performance.

Table 4. 8: Outsourcing of Outbound Logistics

Performance Dimension	Frequency	Percentage (%)
Timeliness	17	16%
Productivity	74	71%
Low costs	96	92%
High product quality	87	84%

4.5.4. Inbound logistics

Claims processing was the only activity that most organizations outsourced as far as inbound logistics was concerned as this parameter had the highest mean score of 3.29 indicative of a maximum of 60% outsourced. Freight consolidation was also somewhat outsourced as this parameter had a mean score of 3.13 whereas the other two variables had mean scores of 3.07 and 3.03. These findings are shown in Table 4.9.

Table 4. 9: Inbound Logistics

	N	Minimum	Maximum	Mean	Std. Deviation
Freight consolidation	104	1	5	3.13	1.141
Claims processing	104	1	5	3.29	1.067
Inbound shipment activities	104	1	5	3.07	1.185
Order management	104	1	5	3.03	1.234
Valid N (list wise)	104				

In relation to inbound logistics, 76% of the respondents indicated that its outsourcing would leave the firm to concentrate on its core functions which would therefore be more timely. 51% of the respondents indicated that the outsourcing of inbound logistics would enable the firm increase productivity. This is because it was likely to be outsourced to a logistics firm which over time may have developed highly skilled manpower and acquired more appropriate technology to manage client's orders. 66% of the respondents indicated that outsourcing of inbound logistics would lead to reduction of related costs. 73% of the respondents expressed their belief that its outsourcing would lead to improved quality of inbound logistics. This was attributed to the fact that the outsourcing agent would offer the services offered as a client attraction and retention tool and would therefore have no option but to offer high quality services in inbound logistics. These findings are shown in Figure 4.4.

These findings are consistent with those of Mulama (2012) who found out that inbound logistics outsourcing practices being adopted by the firms resulted in decreased operating costs, increased productivity, timely delivery of services to clients, improved profits and faster response to customer demands. These findings are also in line with those of Szuster (2010) who found out that outsourcing of inbound logistics results in cost reduction, higher quality and logistics service performance, shorter time of reaction, higher flexibility and bigger possibilities of expansion. These findings also reflect those of Ohnesmus (2009) whose results showed that inbound logistics outsourcing has a considerably positive and significant effect on firm-level productivity, it allows managers to focus on the core business of the firm and the cost savings finally result in an improved business performance. This study concludes that the outsourcing of order management leads to improvement in performance.

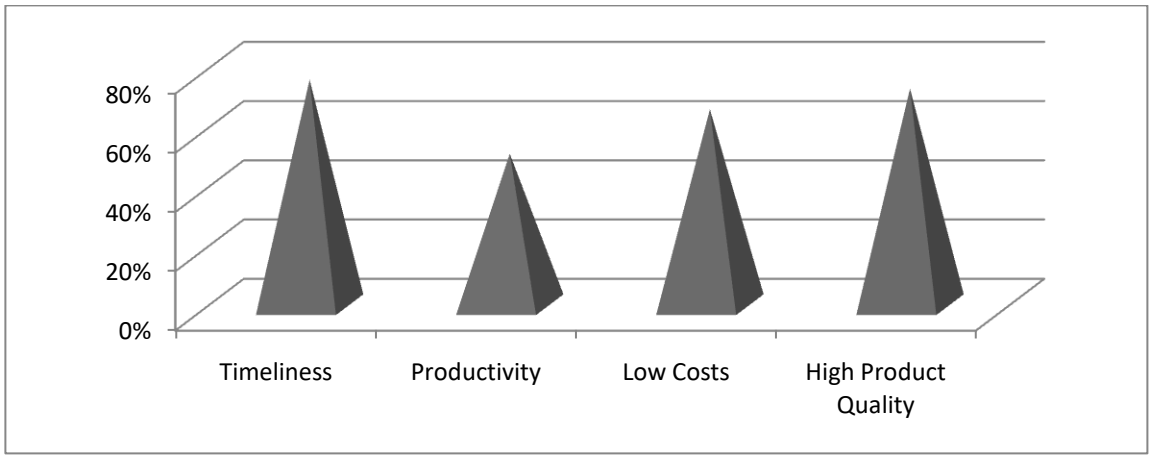

Figure 4. 4: Inbound Logistics Outsourcing

4.5.5. Chi Square Test

In an effort to ascertain the significance of the association between the independent variables primary processes and the dependent variable performance, a chi-square test was conducted. Table 4.10 indicates that, 81 organizations indicated that they outsourced their primary functions in the different levels thus gaining improved performance of less than 50%. It was observed that twenty three (23) organizations that outsourced their primary processes in the different levels gained improvement in performance by more than 50%. This is indicative that primary supply chain processes outsourcing has a relationship with improved performance.

Table 4. 10: Cross tabulation of Primary Supply Chain Processes Outsourcing and Performance

Primary Processes * Performance Cross tabulation					
			Supply chain	**performance**	**Total**
			1% - 50%	51% - 100%	
Primary Processes	0%-20%	Count	16	7	**23**
		Expected Count	17	5	**23**
	21%-40%	Count	9	3	**12**
		Expected Count	9	2	**12**
	41%-60%	Count	32	3	**35**
		Expected Count	27	7	**35**
	61%-80%	Count	19	6	**25**
		Expected Count	19	5	**25**
	81%-100%	Count	5	4	**9**
		Expected Count	1	7	**9**
Total		Count	81	23	**104**
		Expected Count	**81**	**23**	**104**

Table 4.11 indicates that the calculated value of the Chi-Square statistic was 7.33 at 4 degrees of freedom. Because the significance level (0.0077) which is less than the threshold of 0.05, it can be clearly observed that there is a significant association between primary supply chain processes outsourcing and performance.

Table 4. 11: Chi square test of Primary Supply Chain Processes Outsourcing* Performance

Chi-Square Tests			
	Value	df	Asymp. Sig. (2sided)
Pearson Chi-Square	7.366358	4	0.0077488
Likelihood Ratio	7.741716	4	0.0015110
Linear-by-Linear Association	0.003555	1	0.0024537
N of Valid Cases	104		
A	2 cells (20.0%) have expected count less than 5. The minimum expected count is 1.99.		

The symmetric measure confirms that the association is strong and statistically significant (C=0.857 Sig =0.007 as shown in Table 4.12.

Table 4. 12: Symmetric Measures for Primary Supply Chain Processes Outsourcing and Performance

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.857	0.0077
N of Valid Cases		104	
A	Not assuming the null hypothesis.		
B	Using the asymptotic standard error assuming the null hypothesis.		

4.5.6. Correlation

A simple Pearson's correlation was used to confirm the results of the regression analysis, according. The main result of a correlation is called the correlation coefficient (or "r"). It ranges from -1.0 to +1.0. The closer r is to +1 or -1, the more closely the two variables are related. If r is close to 0, it means there is no relationship between the variables. If r is positive, it means that as one variable gets large the other gets larger. If r is negative it means that as one gets larger, the other gets smaller (Brown, 2014). All the tested variables were significant as all of them had a p value of 0.000. From the correlation analysis, it can be noted that primary supply chain processes outsourcing has a relatively strong positive correlation with performance as the r value was 0.556 as shown in Table 4.13.

Table 4. 13: Correlation between Primary Supply Chain Processes Outsourcing and Performance

Correlations			
		Primary processes	Performance
Primary processes	Pearson Correlation	1.000	0.556
	Sig. (2-tailed)		0.002
	N	104.000	95.000
Performance	Pearson Correlation	0.556	1.000
	Sig. (2-tailed)	0.002	
	N	95.000	95.000
*****	Correlation is significant at the 0.05 level (2-tailed).		

4.5.7. Regression Analysis between Primary Supply Chain Process Outsourcing and Performance

The first specific objective tried to establish whether primary supply chain processes outsourcing had a significant effect on performance of manufacturing firms in Kenya. This objective was tested by regressing primary supply chain processes outsourcing on performance guided by the equation $Y= \beta_0+\beta_1X$ where X represented primary process outsourcing and Y denoted performance. The results of the regression are presented in Table 4.14. Table 4.14 displays R (the correlation between the observed and predicted values of the dependent variable), which is .559. This is an average relationship between the observed and predicted values of the dependent variable.

Table 4.14 also displays R squared which is the proportion of variation in the dependent variable explained by the regression model. In this case, it is .455. This means that 45 % of the variation performance (dependent variable) can be explained from the variation in outsourcing primary processes (independent variable). The value of the standard error (sy/x) is shown in the output as .41 The regression was a fair fit describing 45.5% of the variance in primary process outsourcing $R^2adj=43.4\%$ this indicates only a slight overestimate with the model

Table 4. 14: Summary for Primary Supply Chain Processes Outsourcing and Performance

Model Summary				
Model	R	R Square	Adjusted R Square	**Std. Error of the Estimate**
1	0.55974	0.45523	0.43475	0.413994
A	**Predictors: (Constant), Primary processes**			

Table 4.15 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 1.11, the F statistic (the regression mean square (MSR) divided by the residual mean square [MSE]) is 6.52 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 15.94, df as 93 and a mean square of 0.171. The overall relationship was statistically significant ($F_{1,94}$=6.520, $p<0.05$) It has a significance level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship.

Table 4. 15: ANOVA for Primary Supply Chain Processes Outsourcing and Performance

ANOVA(b)						
Model		Sum of Squares	df	Mean Square	F	Sig.
	1 Regression	1.117625	1	1.117625	6.520894	0.002288
	Residual	15.9394	93	0.171391		
	Total	17.05703	94			
A	Predictors: (Constant), Primary processes					
B	Dependent Variable: Performance					

Table 4.16 represents coefficients of the independent variable and the dependent variable. It can be noted from the significance column that the predictor is significant at 0.0076 this is less than 0.05. It can be observed that every time primary process outsourcing is increased by 1 unit, performance is improved by 0.2 units, when all other variables are held constant.

Table 4. 16: Coefficients for Primary Supply Chain Processes Outsourcing and Performance

Coefficients						
Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	1 (Constant)	3.279939	0.278864		11.7618	0.0076
	Primary processes	0.2421	0.094808	0.25597	-2.5536	0.0022
A	**Dependent Variable: Performance**					

4.6. Secondary Processes

This section is intended to facilitate the achievement of the second specific objective of this study: To establish the effect of secondary processes outsourcing on the performance of manufacturing firms in Kenya These section focuses on the four specific functions considered to compose secondary supply chain processes in this study. These include information communication technology, human resources management, procurement management and returns management. In the questionnaire the study sought the responses regarding the outsourcing of various aspects of secondary supply chain processes.

The respondents were required to provide numerical responses (in appropriate units) for each year over a period of five years on the total volume of each activity and numerical responses on the volume of each activity that was outsourced. From these five year responses a simple arithmetic mean was calculated to determine the average volume of the total of each activity and its corresponding outsourced volume. The latter was

expressed as a percentage of the former to determine the level to which the activity in question was outsourced. The computed percentages were then categorized into five categories as follows: 0%-20%, 21%-40%, 41%-60%, 61%-80% and 81%-100%. For more effective and efficient analysis each of the categories was assigned a score of 1,2,3,4 and 5 respectively. The general level of outsourcing adoption was determined by calculating the means and standard deviation for the various statements as per the scores and tabulated**.**

4.6.1. Information communication technology

The results indicated that most respondents agreed to the fact that their organization outsourced software design highly as the parameter had the highest mean score of 4.2. Hardware maintenance and optimization with a mean score of 3.06, network and database management with mean scores of 3.2 and 2.9 respectively were all outsourced to a lesser extent. Data and information backup was also conducted in house as most of the organizations had a resident information technology department which took care of these services as shown in Table 4.17.

Table 4. 17: Information Communication Technology Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Software design	103	1	5	4.20	.943
Hardware maintenance and optimization	104	1	5	3.06	1.221
Network management	104	1	5	3.02	1.115
Database management	104	1	5	2.99	1.178
Data and information backup	104	1	5	2.99	1.029
Valid N (list wise)	103				

In relation to ICT outsourcing 61% of the respondents indicated that it would lead to timeliness, this position was due to the fact the firm would be left to concentrate on its core competencies. 53% of the respondents indicated that it would lead to increase in productivity, when prompted the respondents indicated that this would be due to the fact that outsourcing of ICT would be done to a firm with staff and equipment optimized for best software design. 83% said it would lead to lower costs due to the fact the firm did not have to invest in personnel and equipment for ICT neither did it have to maintain the system. Therefore initial and running costs of ICT would have been eliminated. While 86% indicated that it would lead to high product quality. This was because a firm specialized in ICT was likely to provide high quality software which would then be passed on in the form of improved product quality. These findings are shown in Figure 4.5.

These findings are similar to those of Wang and Shi (2009) who found that outsourcing of ICT enables firms to reduce the cost of system development, increase the flexibility of their business, optimize their business process, respond rapidly to the changing markets, scale quickly based on emerging opportunities, and provide high quality. These findings are also similar to those of Aumeyer and Popp (2007) who found out that in the industrial sector the main benefits underlying hardware maintenance and optimization outsourcing include cost reduction, flexibility ability to concentrate on own core competencies, access to specialized staff, continuous adaptation to technological advancements while reducing technological risks. This study concludes that the outsourcing of ICT does indeed lead to the improvement of performance.

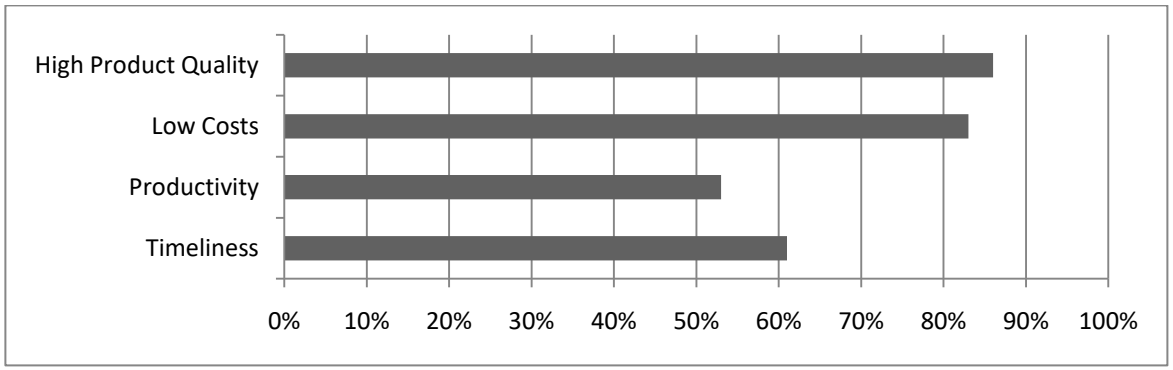

Figure 4. 5: Information Communication Technology Outsourcing

4.6.2. Human resources management

Training was the parameter with the highest mean score of 3.34 with recruitment and selection having mean scores of 3.2 in each case. Staff appraisal had a mean score of 3.07 with reward management having the least score of 2.45 which is lower than average that is 50% thus most organizations preferred to reward their members of staff internally. These findings are shown in Table 4. 18.

Table 4. 18: Human Resources Management Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Recruitment	104	1	5	3.24	1.347
Selection	104	1	5	3.20	1.118
Training	104	1	5	3.34	1.039
Staff appraisal	104	1	5	3.07	1.217
Reward management	103	1	5	2.45	1.055
Valid N (list wise)	103				

Concerning the outsourcing of HRM, 87% of the respondents indicated that its outsourcing would lead to timeliness in HR activities. 95% of the respondents indicated that its outsourcing would lead to increase in productivity due to the recruitment of the right individuals. Only 49% of the respondents indicated that its outsourcing would lead to low costs. 81% of the respondents indicated that outsourcing of recruitment would lead to better product quality. This they argued was due to the fact its outsourcing would attract high quality personnel who would pass on their quality to the firm's operations resulting in high product quality. These findings are shown in Figure 4.6.

These findings are in line with those of Elsaid (2013) who found out that the advantages of human resources management outsourcing were mostly perceived as a possibility to both reduce time pressures, gain access to a large pool of qualified candidates, easy and quick replacement of the critical or specialized position. The cost saving element was not considered as a reason to cooperate with RPO service providers. These findings also reflect those of Greenberg (2013) who states that the effects of human resources management outsourcing puts the reins in the hands of experienced selection consultants saving time and money, improvement of selection processes, reduction a high turnover rate and control rapid growth or seasonality that develop performance, and coordinate recruiting and on-boarding. In conclusion therefore, this study states that the outsourcing of HRM leads to the improvement of performance.

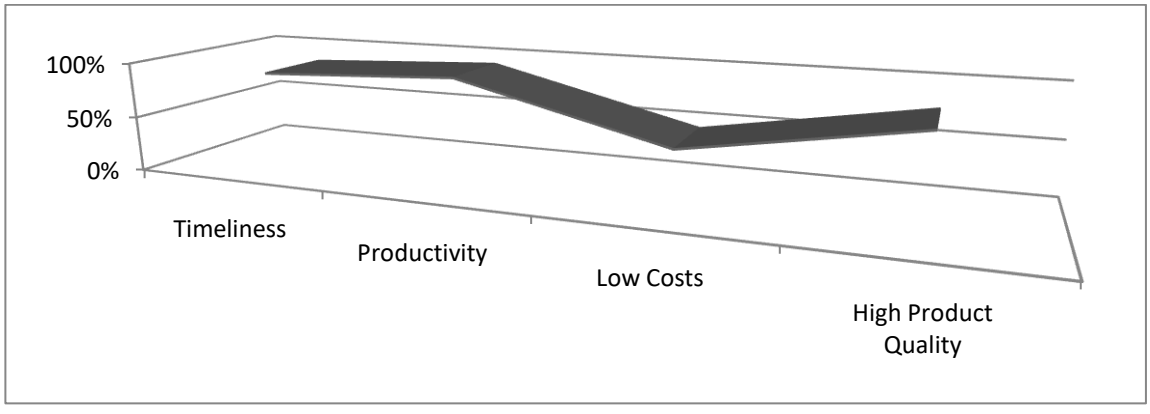

Figure 4. 6: Human Resources Management Outsourcing

4.6.3. Procurement management activities

The study revealed that manufacturing companies generally did not outsource procurement activities heavily as all the parameters had mean scores of less than 3.0. The highest parameter was a tie between supplier evaluation and negotiations with mean scores of 2.88. Contract management had a mean score of 2.86 whereas Supplier identification had a mean score of 2.77**.** These findings are shown in Table 4.19.

Table 4. 19: Procurement Management Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Supplier identification	104	1	5	2.77	1.108
Supplier evaluation	104	1	5	2.88	1.177
Negotiations	104	1	5	2.88	.952
Order placement	104	1	5	2.84	1.175
Contract management	104	1	5	2.86	1.257
Valid N (list wise)	104				

Relative to the outsourcing of procurement management activities, 52% of the respondents indicated that its outsourcing would lead to the achievement of timeliness. 71% of the respondents indicated that outsourcing of procurement management activities would lead to increase in productivity. 85% of the respondents indicated that outsourcing of procurement management activities would lead to low costs related to procurement. 79% of the respondents indicated that outsourcing procurement management activities would lead to high product quality. This was attributed to the probable identification of high quality suppliers who would supply high quality supplies resulting in high quality final products. These findings are shown in Figure 4.7.

These findings correspond to those of Kinyanjui (2014) wherefore his findings were that the outsourcing of procurement management activities increased productivity, cost minimization, profit maximization, operational efficiency, customer Satisfaction, timely delivery of orders and capacity utilization. These findings are also related to those of Gulen (2007) who found out that procurement management outsourcing results in: reductions in the cost structure, quality improvement, and increased effectiveness due to less expediting, rework, repair, and return-to-vendor activities, more responsive and technically sound product introductions. This study concludes that the outsourcing of procurement management leads to improvement of performance.

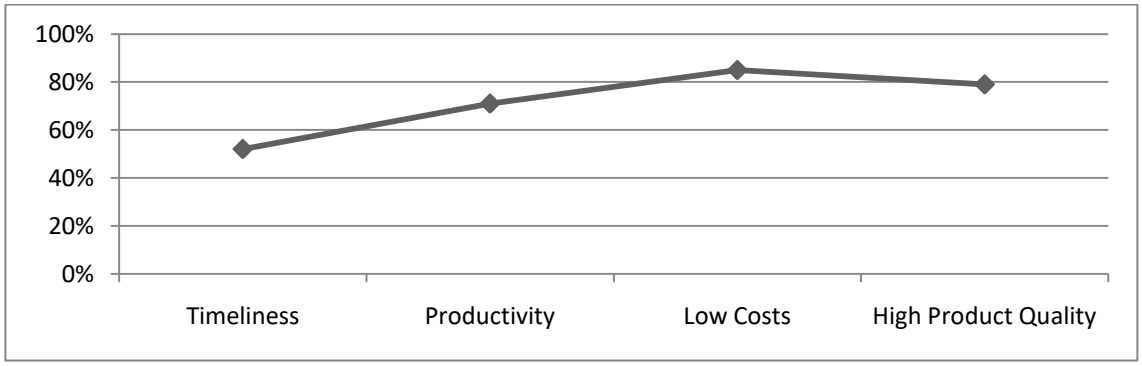

Figure 4. 7: Procurement Management Outsourcing

4.6.4. Returns Management

The study revealed that organizations in the manufacturing sector outsourced receipt of returns as the parameter had the highest mean score of 4.4 and a standard deviation of 0.857. The study ascertained that the rest of processes were outsourced to a lower extent as the parameters ranged from 3.99 – 1.99 with returns scrap declaration being the least outsourced. This is an indicative that most manufacturing companies do outsource their major returns management activities. These findings are shown in Table 4.20.

Table 4. 20: Returns Management Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Returns receipt	104	2	5	4.44	.857
Returns inspection	104	1	3	2.21	.552
Returns shipping	104	1	5	3.99	.782
Returns Scrap declaration	104	1	4	2.46	.812
Valid N (list wise)	104				

In relation to the receipt of returns 32%, 26 % 51% and 62% of the respondents indicated that the outsourcing of returns management would lead to timeliness, increase in productivity, low costs and high product quality. These findings are represented in Table 4.21. These findings contradict those of Grabara (2013) who found out that reduction of costs, flexibility and use of advanced systems was connected with outsourcing of returns receipt. These findings also contradict those of Greve and Davis (2013) who found out that the core benefits for returns inspection outsourcing are: the ability to obtain reverse logistics expertise quickly; achieving greater flexibility and faster speed to market; and creating a protective barrier against outside forces to limit potential liabilities. This study concludes that outsourcing of returns management outsourcing may yield mixed results for the firm in the improvement of performance.

Table 4. 21: Returns Management Outsourcing

Performance Dimension	**Frequency**	**Percentage (%)**
Timeliness	33	32%
Productivity	27	26%
Low costs	53	51%
High product quality	64	62%

4.6.5. Chi Square

In an effort to ascertain the significance of the association between the independent variable secondary supply chain processes outsourcing and the dependent variable performance, a chi-square test was conducted. Table 4.22 indicates that, 74 organizations indicated that they outsourced their secondary supply chain processes in the various levels thus gaining a performance improvement of less than 50%. It was observed that thirty (30) organizations that outsourced their secondary supply chain processes to the various levels got greater than 50% performance improvement. This is indicative that secondary supply chain processes outsourcing has a relationship with performance.

Table 4. 22: Cross Tabulation between Secondary Supply Chain Processes Outsourcing and Performance.

Secondary Processes * Performance Cross tabulation					
				Performance	**Total**
			1%-50%	50%-100%	
Secondary Processes	0%-20%	Count	16	3	**19**
		Expected Count	14	5	**19**
	21%-40%	Count	12	2	**14**
		Expected Count	10	4	**14**
	41%-60%	Count	31	15	**46**
		Expected Count	33	13	**46**
	61%-80%	Count	10	5	**15**
		Expected Count	11	4	**15**
	81%-100%	Count	5	5	**10**
		Expected Count	1	9	**10**
Total		Count	74	30	**104**
		Expected Count	**74**	**30**	**104**

Table 4.23 indicates that the calculated value of the Chi-Square statistic was 5.66 at 4 degrees of freedom. Because the significance level (0.0005) is less than the threshold of 0.05, it can be clearly observed that there is a significant association between secondary supply chain processes outsourcing and performance.

Table 4. 23: Chi-Square Tests between Secondary Supply Chain Processes Outsourcing and Performance

Chi-Square Tests			
	Value		Asymp. Sig. (2 sided)
Pearson Chi-Square	5.66877	4	0.0005
Likelihood Ratio	5.857741	4	0.0100
Linear-by-Linear Association	4.807596	1	0.0008
N of Valid Cases	104		
A	3 cells (30.0%) have expected count less than 5. The minimum expected count is 2.88.		

The association between the two variables was strong with a contingency value of 0.727 which was statically significance sig=0.005 as shown in Table 4.24.

Table 4. 24: Symmetric Measures between Secondary Supply Chain Processes Outsourcing and Performance

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.727354167	0.005287973
N of Valid Cases		104	
A	Not assuming the null hypothesis.		
B	Using the asymptotic standard error assuming the null hypothesis.		

4.6.6. Correlation

A simple Pearson's correlation was used to confirm the results of the regression analysis, according. All the tested variables were significant as all of them had a p value of 0.000. From the correlation analysis, it can be noted that secondary supply chain processes outsourcing has a relatively strong positive correlation with performance as the r value was 0.592 as shown in Table 4.25.

Table 4. 25: Correlation between Secondary Supply Chain Processes Outsourcing and Performance

Correlations			
		Performance	Secondary processes
Performance	Pearson Correlation	1.000	0.592
	Sig. (2-tailed)		0.012
	N	95.000	93.000
Secondary processes	Pearson Correlation	0.592	1.000
	Sig. (2-tailed)	0.012	
	N	93.000	102.000
*	Correlation is significant at the 0.05 level (2-tailed).		

4.6.7. Regression analysis between Secondary Supply Chain Processes Outsourcing and Performance

Objective two sought to establish whether secondary supply chain processes outsourcing had a significant effect on the performance of manufacturing firms in Kenya. This objective was tested by regressing secondary supply chain processes outsourcing on performance guided by the equation $Y= \beta_0+\beta_1X$ where X represented secondary supply chain processes outsourcing and Y denoted Performance. The results of the regression are presented in Table 4.26 which displays R (the correlation between the observed and predicted values of the dependent variable), which is .593. This is an average relationship between the observed and predicted values of the dependent variable.

Table 4.26 also displays R squared which is the proportion of variation in the dependent variable explained by the regression model. In this case, it is .5265. This means that 52 % of the variation in performance (dependent variable) can be explained from outsourcing secondary supply chain processes. The value of the standard error (sy/x) is shown in the output as .418 The regression was a fair fit describing 52.65 % of the variance in secondary business outsourcing system R^2adj=47% this indicates only a slight overestimate with the model

Table 4. 26: Model Summary for Secondary Supply Chain Processes Outsourcing and Performance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.59355	0.5265	0.47015	0.418115
A	Predictors: (Constant), Secondary processes			

Table 4.27 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 1.15, the F statistic (the regression mean square (MSR) divided by the residual mean square [MSE]) is 1.14 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 15.909, df as 91 and a mean square of 0.174. The overall relationship was statistically significant ($F_{1, 92}$ =6.563, $p<0.05$) It has a significant level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship.

Table 4. 27: ANOVA for Secondary Supply Chain Processes Outsourcing and Performance

ANOVA(b)						
Model		Sum of Squares	df	Mean Square	F	**Sig.**
1	Regression	1.147265	1	1.147265077	6.56255828	**0.002059**
	Residual	15.9086	91	0.174819792		
	Total	17.05587	92			
A	Predictors: (Constant), Secondary processes					
B	**Dependent Variable: Performance**					

Table 4.28 represents coefficients of all the independent variables and the dependent variable. It can be noticed from the significant column that the predictor is significant at 0.0028, which is less than 0.05. It can be observed that every time secondary supply chain processes outsourcing is increased by 1 unit, performance is improved by 0.15 units, when all other variables are held constant.

Table 4. 28: Coefficients for Secondary Supply Chain Processes Outsourcing and Performance

Coefficients(a)						
Model		Unstandardized Coefficients		Standardized Coefficients	T	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	3.042005	0.187146		16.2547134	**0.0028**
	Secondary processes	0.15841	0.061837	0.25935522	2.5617491	**0.0020**
A	**Dependent Variable: Performance**					

4.7. Steering Functions

This section is intended to facilitate the achievement of the third specific objective of this study: To examine the effect of steering supply chain processes outsourcing on the improvement of performance for manufacturing firms in Kenya. These section focuses on the four specific functions considered to compose steering supply chain processes in this study. These include planning, coordination, budgeting and monitoring. In the questionnaire the study sought the responses regarding the outsourcing of various aspects of steering supply chain processes.

The respondents were required to provide numerical responses (in appropriate units) for each year over a period of five years on the total volume of each activity and numerical responses on the volume of each activity that was outsourced. From these five year responses a simple arithmetic mean was calculated to determine the average volume of the total of each activity and its corresponding outsourced volume. The latter was expressed as a percentage of the former to determine the level to which the activity in question was outsourced. The computed percentages were then categorized into five categories as follows: 0%-20%, 21%-40%, 41%-60%, 61%-80% and 81%-100%. For more effective and efficient analysis each of the categories was assigned a score of 1,2,3,4 and 5 respectively. The general level of outsourcing adoption was determined by calculating the means and standard deviation for the various statements as per the scores and tabulated**.**

4.7.1. Planning

Findings from the study revealed that most planning activities were conducted in-house with an exception of environmental assessment as this parameter had the highest mean score of 4.45 with the rest of the parameters having less mean scores. The study also revealed that most organization conducted self-evaluation for benchmarking purposes as this parameter had a mean score of 2.82. The results from the environmental

assessment were used in in-house goal setting and strategy formulation as this parameters had low mean scores of 2.8 and 2.9. These findings are shown in Table 4.29.

Table 4. 29: Outsourcing of Planning

	N	Minimum	Maximum	Mean	Std. Deviation
Environmental assessment	104	1	5	4.45	1.114
Goal/objective setting	104	1	5	2.86	1.118
Strategy formulation	104	1	5	2.93	1.117
Budgeting	103	1	5	2.79	1.081
Implementation	104	1	5	2.72	1.019
Evaluation	104	1	5	2.82	1.059
Valid N (list wise)	103				

Relative to the outsourcing of planning, 73% of the respondents indicated that it would lead to timeliness due to a better understanding of the environment. 69% of the respondents indicated that the outsourcing of planning would lead to increased productivity due to appropriate plans. Outsourcing of planning was said would lead to low costs according to 86% of the respondents. They posit that appropriate assessment would lead to the formulation of appropriate strategies and budgets hence resulting in overall efficiency in the utilization of available resources. 62% of the respondents indicated that outsourcing of the planning process would lead to high product quality. These findings are shown in Figure 4.8.

These findings reflect those of Rajee, Surab and Hamed (2013) who found out that that planning outsourcing is beneficial to organizational performance, and enhances firm's financial economies and performance in the market place. These findings are also similar to those of Ohnemus (2009) who found that planning outsourcing has a considerably positive and significant effect on firm-level productivity. It allows

managers to focus on the core business of the firm. Moreover, the qualified and experienced work of the service provider and the cost savings finally result in an improved business performance. These findings also confirm those Awino and Mutua (2014) who established that there is a significant relationship between planning outsourcing and overall firm performance made up of; profitability, cost efficiency, firm image, customer satisfaction and process efficiency. This study concludes that the outsourcing of environmental assessment leads to the improvement of environmental assessment.

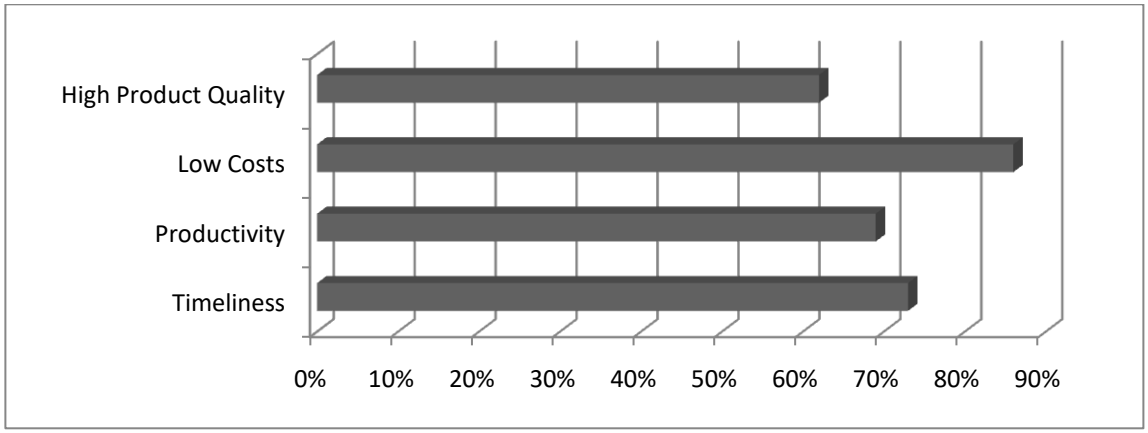

Figure 4. 8: Outsourcing of Planning

4.7.2. Coordination activities

The study revealed that organizations in the manufacturing sector outsourced resource sharing as the parameter had the highest mean score of 4.4 and a standard deviation of 0.857. The study ascertained that the rest of processes were outsourced to a low extent as the parameters ranged from 2.21 – 1.99 with conditions being the least outsourced. This is indicative that most manufacturing companies do not outsource their major manufacturing activities. These findings are shown in Table 4.30.

Table 4. 30: Coordination Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Resource Sharing	104	2	5	4.44	.857
Joint forecasting	104	1	3	2.21	.552
Joint decisions	104	1	4	2.19	.687
Supply chain partnerships establishment	104	1	5	1.99	.782
Valid N (list wise)	104				

In relation to the outsourcing of coordination, 32%, 26% 51% and 62% of the respondents indicated that its outsourcing lead to timeliness, increase in productivity, low cost and high product quality respectively. These findings are represented in Table 4.31. These findings contradict those of Strange (2013) who found out that coordination outsourcing enables the firm to concentrate on core competencies, gain access to expertise and competencies not available in-house, and to take advantage of economies of scale and/or scope provided by external suppliers.

These findings also contradict Berlingieri (2014) who found out that three main benefits may affect the firm's decision to contract out its coordination; namely: wage cost savings, the volatility of output demand, and the external provider's specialized skills. These findings also contradict those of Reilly (2014) who found out that coordination outsourcing might be chosen to reduce expenditure, change the organisational culture, improve resourcing flexibility, access to technology or skills that is obtainable at an acceptable cost only through an external supplier. This study concludes that outsourcing of coordination does not lead to the improvement of performance.

Table 4. 31: Coordination Outsourcing

Performance Dimension	Frequency	Percentage (%)
Timeliness	33	32%
Productivity	27	26%
Low costs	53	51%
High product quality	64	62%

4.7.3. Budgeting process

The parameter with the highest mean score in budgeting outsourcing was budget development with a mean score of 3.18. Budget evaluation and development of budgetary estimates had mean scores of 2.98 and 2.9 respectively. These findings reveal that most manufacturing companies prefer to carry out budgeting functions in house. This is evident from the mean scores of less than 3.0. These findings are shown in Table 4.32.

Table 4. 32: Budgeting Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Gathering of budgeting data	104	1	5	3.02	1.140
Development of budgetary Estimates	104	1	5	2.90	1.102
Budget development	104	1	5	3.18	1.172
Budget Evaluation	104	1	5	2.98	1.254
Valid N (list wise)	104				

In relation to budgeting only 16% of the respondents indicated that it would lead to timeliness. 71% of the respondents indicated that its outsourcing would lead to increase in productivity. 92% indicated that its outsourcing would lead to reduced costs since the costs associated with it will have been transferred to the outsourcing agent. 84% of the respondents indicated that outsourcing of the budgeting process would lead to high quality data. These findings are represented in Table 4.33.

These findings confirm those of Kamyabi and Devi (2011) who found out that its outsourcing has a positive impact on firm performance. These findings to an extent confirm those of Bersin (2005) who found out that outsourcing of budgeting led to reduction of costs in three areas: implementation costs, operational costs and technical staff costs. It was also found to free up resources in the outsourcing organization, increase business effectiveness, facilitate the reallocation of resources and provides an opportunity for business to evaluate new technology and approaches for greater efficiency and effectiveness. These findings mirror those of accounting and audit firm Deloitte (2012) who found out that outsourcing of the budget process leads to improved business insight, budget standardisation and the introduction of a single management performance metric package and a reduction in time spent building budgets, and freeing time for analysis. This study concludes that outsourcing of the budget process leads to improvement of performance.

Table 4. 33: Budget Process Outsourcing

Performance Dimension	Frequency	Percentage (%)
Timeliness	17	16%
Productivity	74	71%
Low costs	96	92%
High product quality	87	84%

4.7.4. Monitoring activities

The study found out that most organizations outsourced the collection of supply chain monitoring and evaluation data as this parameter had the highest mean score of 3.64. The data collected is then used in-house for establishing performance baseline as this parameter had a mean score of 2.6. The study also established that Knowledge sharing on supply chain monitoring in the manufacturing industry was not popular as this parameter had the lowest mean score of 2.4. These findings are shown in Table 4.34.

Table 4. 34: Monitoring Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Selection of supply chain indicators to monitor	104	1	5	2.60	1.057
Establishment of performance baselines	104	1	5	2.62	1.091
Collection of supply chain monitoring and evaluation data	104	1	5	3.64	1.088
Analysis and evaluation of supply chain monitoring data	104	1	5	2.71	1.094
Knowledge sharing on supply chain monitoring	104	1	5	2.47	1.033
Valid N (list wise)	104				

In relation to monitoring 51% of the respondents indicated that its outsourcing would lead to timeliness. Only 16% of the respondents indicated that its outsourcing would lead to increase in productivity. 14% of the respondents indicated that the outsourcing of selection of supply chain indicators to monitor would lead to low costs. 48% of the respondents indicated its outsourcing would lead to high product quality. These findings are shown in Table 4.35. These findings confirm those of Jiang, Stanford, and Xie (2012) and Rashed, Azeem and Halim (2010) who found that supply chain monitoring outsourcing agents were lax when monitoring their own paying clients and it does not lead to operational performance but contrary to those of Lapide (2000) who found that outsourced monitoring is important to directly controlling behavior and indirectly to performance, outsourced monitoring will go a long way toward keeping a company on track towards achieving its supply chain improvement objectives. This study concludes that outsourcing of supply chain monitoring does not lead to the improvement of performance.

Table 4. 35: Outsourcing of Monitoring

Performance Dimension	Frequency	Percentage (%)
Timeliness	53	51%
Productivity	16	16%
Low costs	15	14%
High product quality	50	48%

4.7.5. Chi Square Test

In determining the significance of the association between the independent variables steering supply chain processes outsourcing and the dependent variable performance, a chi-square test was conducted. Table 4.36 indicates that, 77 organizations indicated that they outsourced their steering functions at the various levels thus gaining a performance improvement of less than 50%. It was observed that twenty seven (27) organizations that outsourced their steering supply chain processes at the various levels specified and got greater than 50% performance improvement.

Table 4. 36: Cross Tabulation between Steering Supply Chain Processes Outsourcing and Performance

Steering Functions * Performance Cross Tabulation					
			Performance		Total
			1%-50%	51%-100%	
Steering Functions	0%-20%	Count	18	5	23
		Expected Count	17	6	23
	21%-40%	Count	9	3	12
		Expected Count	9	3	12
	41%-60%	Count	26	9	35
		Expected Count	26	9	35
	61%-80%	Count	19	6	25
		Expected Count	19	6	25
	81%-100%	Count	5	4	9
		Expected Count	2	7	9
Total		Count	77	27	104
		Expected Count	77	27	104

Table 4.37 indicates that the calculated value of the Chi-Square statistic was 1.869 at 4 degrees of freedom. Because the significance level (0.0005) is less than the threshold of 0.05, it can be clearly observed that there is a significant association between steering supply chain processes outsourcing and performance.

Table 4. 37: Chi-Square Tests between Steering Supply Chain Processes Outsourcing and Performance

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.869803	4	0.009
Likelihood Ratio	1.70846	4	0.009
Linear-by-Linear Association	0.757937	1	0.004
N of Valid Cases	104		
A	2 cells (20.0%) have expected count less than 5. The minimum expected count is 2.34.		

The association was strong with a contingency value of 0.83 which was statically significance sig=0.005 as shown by Table 4.38.

Table 4. 38: Symmetric Measures between Steering Supply Chain Processes Outsourcing and Performance

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.83	0.0068
N of Valid Cases		104	
A	Not assuming the null hypothesis.		
B	Using the asymptotic standard error assuming the null hypothesis.		

4.7.6. Pearson's correlation

A simple Pearson's correlation was used to confirm the results of the chi square, according. All the tested variables were significant as all of them had a p value of 0.000. From the correlation analysis, it can be noted that steering supply processes outsourcing has a relatively strong positive correlation with performance as the r value was 0.558 as shown in Table 4.39.

Table 4. 39: Correlation between Steering Processes Outsourcing and Performance

Correlations			
		Performance	Steering processes
Performance	Pearson Correlation	1.000	0.558
	Sig. (2-tailed)		0.000
	N	95.000	95.000
Steering processes	Pearson Correlation	0.558	1.000
	Sig. (2-tailed)	0.000	
	N	95.000	103.000
****	Correlation is significant at the 0.01 level (2-tailed).		

4.7.7. Regression Analysis between Steering Supply Chain Processes Outsourcing and Performance

Objective three tried to establish whether steering supply chain processes outsourcing had a significant effect on the performance of manufacturing firms in Kenya. This objective was tested by regressing steering supply chain processes outsourcing on performance guided by the equation $Y= \beta_0+\beta_1X$ where X represented steering processes outsourcing and Y denoted Performance. The results of the regression are presented in table 4.40.

Table 4.40 displays R (the correlation between the observed and predicted values of the dependent variable), which is .557. This is an average relationship between the observed and predicted values of the dependent variable. The table also displays R squared which is the proportion of variation in the dependent variable explained by the regression model. In this case, it is .511. This means that 51% of the variation performance (dependent variable) can be explained from outsourcing steering supply chain processes. The value of the standard error (sy/x) is shown in the output as .355 The regression was a fair fit describing 51% of the variance in steering processes outsourcing R^2adj=50.3% this indicates only a slight overestimate with the model.

Table 4. 40: Model Summary for Steering Supply Chain Processes Outsourcing and Performance

Model Summary					
Model		R	R Square	Adjusted R Square	Std. Error of the Estimate
	1	0.557669	0.510995	0.503586	0.355485
A		Predictors: (Constant), Steering processes			

Table 4.41 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 5.3, the F statistic (the regression mean square (MSR) divided by the residual mean square [MSE]) is 5.304 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 11.75, df as 93 and a mean square of 0.12. The overall relationship was statistically significant ($F_{1,94}$=41.977, $p<0.05$) It has a significant level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship.

Table 4. 41: ANOVA for Steering Supply Chain Processes Outsourcing and Performance

ANOVA(b)						
Model		Sum of Squares		Mean Square	F	**Sig.**
1	Regression	5.304649	1	5.304649072	41.9772299	**0.000**
	Residual	11.75238	93	0.126369679		
	Total	17.05703	94			
A	Predictors: (Constant), Steering processes					
B	Dependent Variable: Performance					

Table 4.42 represents coefficients of all the independent variables and the dependent variable. It can be noticed from the significance column that the predictor is significant at 0.002 this is less than 0.05. It can be observed that every time steering supply chain processes outsourcing is increased by 1 unit, performance is improved by 0.39 units, when all other variables are held constant.

Table 4. 42: Coefficients for Steering Process Outsourcing and Performance

Coefficients(a)						
Model		Unstandardized Coefficients		Standardized Coefficients	T	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	1.521472	0.166819		9.12050217	**0.002**
	Steering processes	0.395737	0.06108	0.557669166	6.47898371	**0.004**
A	Dependent Variable: Performance					

4.8. Decision Processes

This section is intended to facilitate the achievement of the fourth specific objective of this study: To determine the effect of decision processes outsourcing on the improvement of performance for manufacturing firms in Kenya. This section focuses on the four specific functions considered to compose decision supply chain processes in this study. These include inventory management, layout decisions, location decisions and technology decisions. In the questionnaire the study sought the responses regarding the outsourcing of various aspects of decision supply chain processes.

The respondents were required to provide numerical responses (in appropriate units) for each year over a period of five years on the total volume of each activity and numerical responses on the volume of each activity that was outsourced. From these five year responses a simple arithmetic mean was calculated to determine the average volume of the total of each activity and its corresponding outsourced volume. The latter was expressed as a percentage of the former to determine the level to which the activity in question was outsourced. The computed percentages were then categorized into five categories as follows: 0%-20%, 21%-40%, 41%-60%, 61%-80% and 81%-100%. For more effective and efficient analysis each of the categories was assigned a score of 1,2,3,4 and 5 respectively. The general level of outsourcing adoption was determined by calculating the means and standard deviation for the various statements as per the scores and tabulated**.**

4.8.1. Inventory management

The inventory management activities that were considered in the study were; Formulation of inventory management policies, Sales forecasting, Product mix at stocking points, Number and size of stocking points and Inventory layout and dock design. All the parameters under consideration had mean scores of less than 3.0 with the highest parameter scoring 2.8. This clearly reveals that inventory management in the manufacturing industry is not highly outsourced. These findings are shown in Table 4.43.

Table 4. 43: Inventory Management Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Formulation of inventory management policies	104	1	5	2.46	1.061
Sales forecasting	104	1	5	2.69	1.107
Product mix at stocking points	104	1	5	2.74	1.174
Number and size of stocking points	104	1	5	2.80	1.144
Inventory layout and dock design	103	1	5	2.67	1.200
Valid N (list wise)	103				

Relative to inventory management outsourcing, 58% of the respondents indicated that its outsourcing led to timeliness. 72% of the respondents indicated that the outsourcing of the inventory management would lead to increase in productivity. 51% of the respondents indicated that the outsourcing of inventory management would lead to low costs, this was attributed to the fact that none of the firm's resources would have to be diverted to the inventory management. 49% of the respondents indicated that its outsourcing would lead to high quality products. These findings are shown in Figure 4.9.

These findings are similar to those of Wiart and Herzberg (2009) who found that its outsourcing results in higher levels of performance at reduced cost, moving assets off the books, reducing costs associated with spares and scrap, maintain customer satisfaction, leverage world-class capabilities and redistribute risks. These findings correspond to those of Zayzan (2011) whose analysis showed positive relationship with logistics outsourcing performance, particularly strategic focus and cost reduction was the most desired benefit out of logistics outsourcing. These findings contradict those of Bjurstrom (2008) who found out that outsourcing of inventory management 3PLs leads to: focus on core competencies, limit capital investments, changing fixed costs into variable costs, benefit from established best practices, adaptability and flexibility. This study concludes that the outsourcing of the formulation of inventory management leads to the improvement of performance.

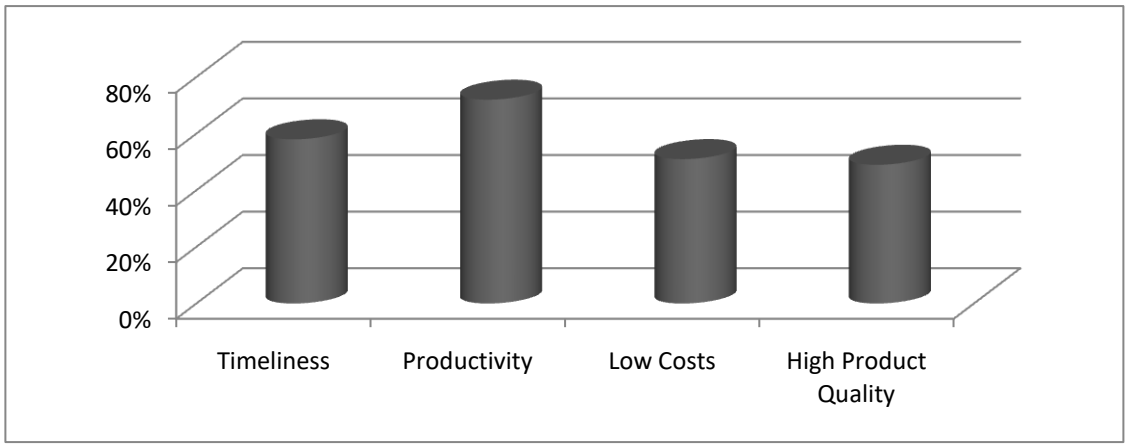

Figure 4. 9: Outsourcing of Inventory Management

4.8.2. Layout decisions

The study established that most manufacturing firms outsourced the determination of machinery requirements as this parameter had a mean score of 4.43 which when converted to percentage, would result to above 85% of the firms. The analysis of product and process operations and determination of work flow were moderately outsourced as these parameters had a mean score of 3.53 in each case. The study

however established that after the workflow had been outsourced, determination of materials flow and the implementation and evaluation of layout design were minimally outsourced as these parameters had a mean score of 2.63 and 2.3 respectively. These findings are shown in Table 4.44.

Table 4. 44: Layout Decisions Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Analysis of product and process operations	104	1	5	3.53	1.052
Determination of machinery requirements	104	1	5	4.43	.879
Deter monition of workflow	104	1	5	3.53	1.079
Determination of materials flow	104	1	5	2.32	1.108
Implementation and evaluation of layout design	102	1	4	2.63	.911
Valid N (list wise)	102				

Concerning the analysis of organizational layout decisions 91% of the respondents indicated that its outsourcing would lead to more timeliness of firm manufacturing operations since it would lead to the identification of machine and operation dependencies as well as operations sequences. 89% of the respondents indicated that its outsourcing would lead to increase in productivity since at this phase the outsourcing agent would ensure that machine compatibility is enhanced and optimal technology would be determinable from this point. 71% of the respondents indicated that its outsourcing would lead to low costs. 83% of the respondents indicated that the outsourcing of organizational layout decisions would lead to high product quality. This was attributable to the identification and sequential arrangement of quality determinants in a manner likely to maximize it. These findings are shown in Figure 4.10.

These findings are similar to those of Momme and Hvolby (2002) who found that outsourcing of layout decisions to a third party would lead to link organizational strategy to well-defined business processes, align business execution and operation activity with strategy, improved performance, process agility, adaptability and addressing business challenges effectively. Kenyon, Meixell, and Westfall (2015) also found that layout decisions outsourcing would enable the firm to acquire adequate machinery, minimize idle time in operations, meet the needs of different user groups and stakeholders, access expertise it otherwise would not have within the firm, and eventually result in a high quality product in a manufacturing firm. These findings correspond to those of Belime (2010) who found that its outsourcing enhances utilization of space, facilitates supervision, facilitates internal communication, provides good working environment to staff, helps in utilizing firm assets to maximum extent and provides balanced capacity of equipment and personnel at each stage in work flow, which leads to the improvement of performance. This study concludes that the outsourcing of layout determination leads to the improvement of performance.

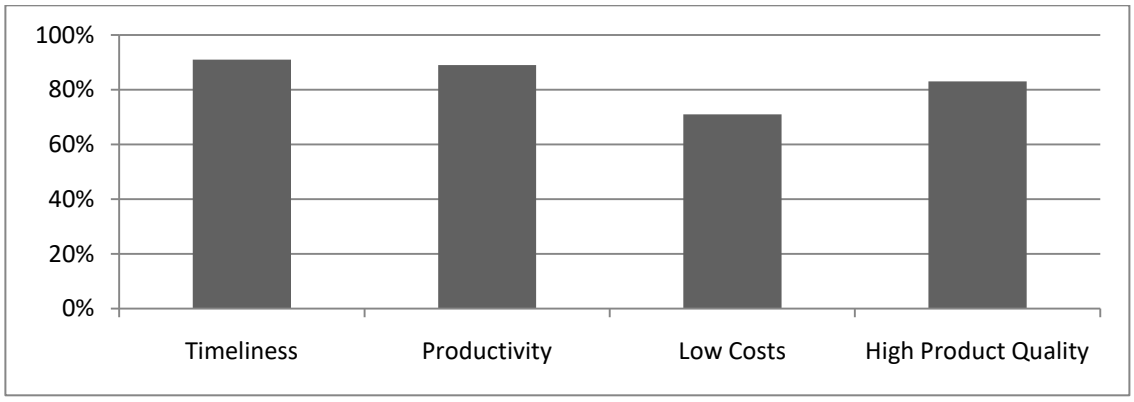

Figure 4. 10: Layout Decisions Outsourcing

4.8.3. Location decisions

From the study it was evident that most manufacturing firms outsourced the definition of location objectives as this parameter had the highest mean score of 4.37. Apparently, most organizations did not outsource the definition of location constraints or data collection and analysis as these parameters had low mean scores of 2.16 and 2.29. It was

also evident that the selection of a location was purely internal alongside the identification of the relevant decision criteria as this parameter had the lowest mean score of 1.85. These findings are shown in Table 4.45.

Table 4. 45: Location Decisions Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Definition of location objectives	104	2	5	4.37	.848
Definition of location constraints	102	1	3	2.16	.461
Identification of the relevant decision criteria	102	1	4	1.85	.825
Location data collection and analysis	104	1	4	2.29	.706
Location selection	102	1	4	2.28	.763
Valid N (list wise)	98				

Outsourcing of location decisions was said to lead to timeliness by 13% of the respondents. 73% of the respondents indicated it would lead to an increase in productivity since it would by extension influence the location decision into an optimal location. 56% of the respondents indicated that it would lead to low costs especially if the minimization of costs through the location was one of the objectives. 83% of the respondents indicated that it would lead to high product quality, since one of the objectives likely to be formulated would be high product quality. These findings are shown in Figure 4.11.

These findings to an extent both confirm and contradict those of Niskanen (2013) who found out that benefits of outsourcing the location decisions include, the lower overall cost, better service, increased quality, flexibility, access to the latest technology, investments in plants, equipment and skilled labor can be reduced. These findings are in line with those of MacCarthy and Atthirawong (2003) who found that its outsourcing leads to adequate access to latest technology, customers, workers, transportation, materials and maximization of opportunity while minimizing costs and risks. These findings reflect those of Vestring, Rouse and Reinert (2005) who found that the outsourcing of location decisions of the leads the firm to enjoy reduced costs, culture/language alignment, stable economic climate, access to good infrastructure, access to expertise and appropriate technology.

These findings contradict those of Liu, Berger, Zeng and Gerstenfeld (2008), who found that the outsourcing of location decision leads to easier and faster availability of raw materials, proximity to the market, good infrastructure, adequate supply of power and fuel, climatically suitable firm location, easy and faster access to capital. This study concludes that the outsourcing of definition of location objectives leads to the improvement of performance.

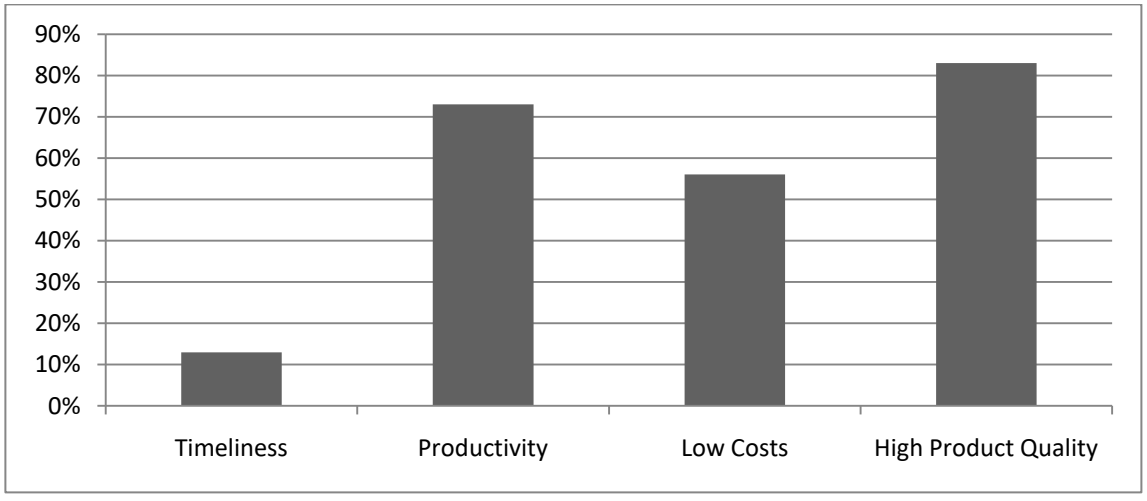

Figure 4. 11: Outsourcing of Location Decisions

4.8.4. Technology Decisions

Transportation technology decisions was the only activity that most organizations outsourced as far as technology decisions was concern as this parameter had the highest mean score of 3.29 indicative of a maximum of 60% outsourced. Manufacturing technology decisions was also somewhat outsourced as this parameter had a mean score of 3.13 whereas the other two variables had mean scores of 3.07 and 3.03. These findings are shown in Table 4.46.

Table 4. 46: Technology Decisions Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Manufacturing technology decisions	104	1	5	3.13	1.141
Transportation technology decisions	104	1	5	3.29	1.067
Warehousing technology decisions	104	1	5	3.07	1.185
Communication technology	104	1	5	3.03	1.234
Valid N (list wise)	104				

With regards to technology decisions 53% of the respondents indicated outsourcing it would lead to timeliness. 13% indicated that it would lead to increase in productivity. 10% indicated that it would lead to lower cost. While only 6% indicated that it would lead improved product quality. These findings are illustrated in Table 4.47. These findings contradict those of Manning, Massini and Lewin (2008) who found that outsourcing technology decisions enables the firm to reduce costs, access external technological knowledge. The firm will also be better equipped to avoid contracting hazards, as the outsourcing agent's capabilities allow them to select capable suppliers

and to better monitor their behavior; it enables a firm to adopt a strategy for local responsiveness and to exploit their technological knowledge (efficiency reasons) or to explore or acquire new one (knowledge reasons). These findings contradict those of De Villiers, Nieman and Nieman, (2011) who found out that outsourcing may actually yield strategic advantage by permitting outsourcers to leverage providers' knowledge capabilities. Outsourcing is also strategically advantageous in that it permits the outsourcer to focus on its core competencies. This study concludes that the outsourcing of technology decisions does not lead to the improvement of performance for manufacturing firms.

Table 4. 47: Outsourcing of Technology Decisions

Performance Dimension	Frequency	Percentage (%)
Timeliness	55	53%
Productivity	14	13%
Low costs	10	10%
High product quality	6	6%

4.8.5. Chi Square

In an exertion to ascertain the significance of the association between the independent variables decision processes and the dependent variable performance, a chi-square test was conducted. Table 4.48 indicates that, 56 organizations indicated that they outsourced their decision supply chain processes within the various categories thus gaining a performance improvement of less than 50%. It was observed that forty seven (47) organizations that outsourced their decision supply chain processes within the given levels got greater than 50% performance improvement. This is indicative that decision supply chain processes outsourcing has a relationship with performance.

Table 4. 48: Cross Tabulation between Decision Processes Outsourcing and Performance

Decision process * Performance tabulation					
			Supply chain 1%-50%	Performance 51%-100%	Total
Decision process	0%-20%	Count	11	8	19
		Expected Count	10	9	19
	21%-40%	Count	6	8	14
		Expected Count	8	6	14
	41%-60%	Count	25	20	45
		Expected Count	24	21	45
	61%-80%	Count	9	6	15
		Expected Count	8	7	15
	81%-100%	Count	5	5	10
		Expected Count	1	9	10
Total		Count	56	47	103
		Expected Count	56	47	103

Table 4.49 indicates that the calculated value of the Chi-Square statistic was at 1.13 at 4 degrees of freedom. Because the significance level (0.0031) is less than the threshold of 0.05. It can be clearly observed that there is a significant association between decision supply chain processes outsourcing and performance

Table 4. 49: Chi-Square Tests between Decision Processes Outsourcing and Performance

Chi-Square Tests			
	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.137229	4	0.0031
Likelihood Ratio	1.135725	4	0.0005
Linear-by-Linear Association	0.001654	1	0.0068
N of Valid Cases	103		
A	1 cell (10.0%) has expected count less than 5. The minimum expected count is 4.56.		

The association was strong with a contingency value of 0.90 which was statistically significant at sig=0.003 as shown in Table 4.50.

Table 4. 50: Symmetric Measures between Decision Processes Outsourcing and Performance

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.90	0.003
N of Valid Cases		103	
A	Not assuming the null hypothesis.		
B	Using the asymptotic standard error assuming the null hypothesis.		

4.8.5. Correlation

A simple Pearson's correlation was used to confirm the results of the relationship between decision supply chain processes outsourcing and performance. All the tested variables were significant as all of them had a p value of 0.000. From the correlation analysis, it can be noted that decision processes outsourcing has a relatively weak positive correlation with performance as the r value was 0.240 as shown in Table 4.51.

Table 4. 51: Correlation between Decision Supply Chain Processes Outsourcing and Performance

Correlations			
		Performance	Decision processes
Performance	Pearson Correlation	1.000	0.004
	Sig. (2-tailed)		0.240
	N	95.000	91.000
Decision processes	Pearson Correlation	0.240	1.000
	Sig. (2-tailed)	0.001	
	N	91.000	100.000

4.8.6. Simple Linear Regression

Objective four tried to establish whether decision supply chain processes outsourcing had a significant effect on the performance of manufacturing firms in Kenya. This objective was tested by regressing decision supply chain processes outsourcing and performance guided by the equation $Y= \beta_0+\beta_1X$ where X represented decision process outsourcing and Y denoted Performance. The results of the regression are presented in Table 4.52.

Table 4.52 displays R (the correlation between the observed and predicted values of the dependent variable), which is .4821. This is an average relationship between the observed and predicted values of the dependent variable. The table also displays R squared which is the proportion of variation in the dependent variable explained by the regression model. In this case, it is .452. This means that 45.2 % of the variation performance (dependent variable) can be explained from outsourcing decision supply chain processes. The value of the standard error (sy/x) is shown in the output as .43 The regression was a fair fit describing 45.2% of the variance in decision process $R^2adj=43.69$ this indicates only a slight overestimate with the model.

Table 4. 52: Model Summary for Decision Supply Chain Processes Outsourcing and Performance

Model Summary				
Model	R	R Square	Adjusted R Square	**Std. Error of the Estimate**
1	0.4821	0.452	0.41122	**0.4369**
A	**Predictors: (Constant), Decision processes**			

Table 4.53 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 1.12, the F statistic (the regression mean square (MSR) divided by the residual mean square [MSE]) is 0.1299 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 16.99, df as 89 and a mean square of 0.190. The overall relationship was statistically significant ($F_{1, 89}$ =0.1299, $p<0.05$) It has a significant level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship.

Table 4. 53: ANOVA for Decision Processes Outsourcing and Performance

ANOVA(b)						
Model		Sum of Squares	df	Mean Square	F	**Sig.**
1	Regression	1.124058	1	0.248077	0.12992	**0.001328**
	Residual	16.99423	89	0.190946		
	Total	16.99448	90			
A	Predictors: (Constant), decision processes					
B	**Dependent Variable: Performance**					

Table 4.54 represents coefficients of all the independent variables and the dependent variable. It can be noticed from the significant column that the predictor is significant at 0.0052 which is less than 0.05. It can be observed that every time decision supply chain processes outsourcing is increased by 1 unit, performance is improved by 0.23 units, when all other variables are held constant.

Table 4. 54: Coefficients for Decision Processes Outsourcing and Performance

Coefficients(a)						
Mode l		Unstandardized Coefficients		Standardized Coefficients	T	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	2.56685	0.19352		13.264	**0.0052**
	Decision processes	0.23600	0.06561	0.00382067	0.0360	**0.0091**
A	**Dependent Variable: Performance**					

4.9. Communication Processes

This section is intended to facilitate the achievement of the fifth specific objective of this study: To assess the effect of communication processes outsourcing on the improvement of performance for manufacturing firms in Kenya. These section focuses on the four specific functions considered to compose communication supply chain processes in this study. These include supplier communication, customer communication, internal communication and competitor communication. In the questionnaire the study sought the responses regarding the outsourcing of various aspects of supply chain communication processes.

The respondents were required to provide numerical responses (in appropriate units) for each year over a period of five years on the total volume of each activity and numerical responses on the volume of each activity that was outsourced. From these five year responses a simple arithmetic mean was calculated to determine the average volume of the total of each activity and its corresponding outsourced volume. The latter was expressed as a percentage of the former to determine the level to which the activity in question was outsourced. The computed percentages were then categorized into five categories as follows: 0%-20%, 21%-40%, 41%-60%, 61%-80% and 81%-100%. For more effective and efficient analysis each of the categories was assigned a score of 1,2,3,4 and 5 respectively. The general level of outsourcing adoption was determined by calculating the means and standard deviation for the various statements as per the scores and tabulated**.**

4.9.1. Supplier communication

The results from the survey revealed that most organizations outsourced the formulation, implementation and maintenance of supplier relationship management systems even though most respondents were skeptical about the maintenance aspect they agreed that this process was most of the time outsourced as this parameter had the highest mean score of 4.1. The respondents sentiments about the skepticism witnessed earlier were evident as the bit of Supplier database maintenance scored a low mean of 3.1. Other parameters that scored a low mean score included; Supplier feedback acquisition with a mean score of 3.18, supplier performance and rating communication with a mean score of 3.04 and finally supplier communication receipt which had the lowest mean score of 2.96 as the respondent preferred to have direct communication with their suppliers, as shown in table 4.55.

Table 4. 55: Supplier Communication Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Formulation, implementation and maintenance of supplier relationship management	101	1	5	4.10	1.179
Supplier database maintenance	104	1	5	3.16	1.208
Supplier feedback acquisition	104	1	5	3.18	1.205
supplier performance and rating communication	104	1	5	3.04	1.070
Supplier communication receipt	104	1	5	2.96	1.131
Valid N (list wise)	101				

Relative to the outsourcing of supplier communication, 76% of the respondents indicated that it would lead to timeliness of interactions with suppliers. 53% of the respondents indicated that it would lead to increase in productivity due to alignment of supplier and firm objectives. 32% of the respondents indicated it was likely to lead to low costs. 8% of the respondents indicated that it would lead to high product quality. These findings are shown in Figure 4.12.

These findings are to extent similar to those of Mayombwe (2012) who found out that its outsourcing helps a firm to stay in business, out compete its competitors, acquire supplies in time in order to fulfill customers' demands thus boosting customer satisfaction which later replicates in improved performance. These findings also mirror those of Abdallah, Abdallah and Hamdan (2014) which revealed that a firm will improve its performance by outsourcing its supplier communication. This study concludes that the outsourcing of SRM may not necessarily lead to the improvement of performance.

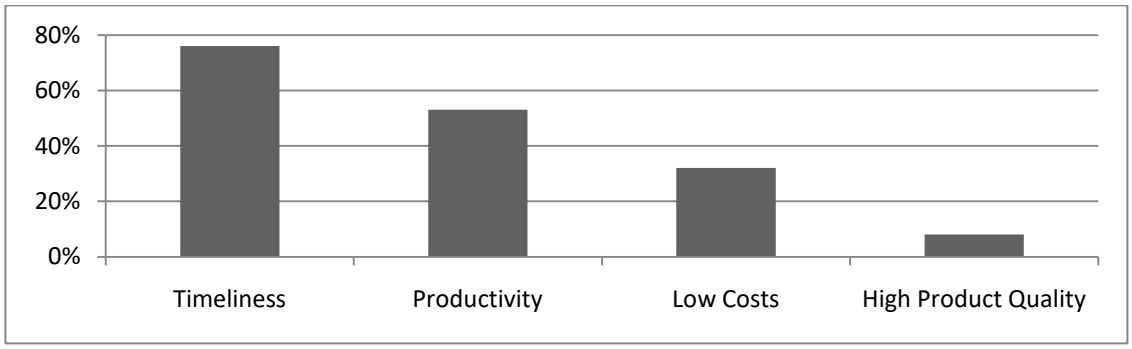

Figure 4. 12: Outsourcing of Supplier Communication

4.9.2. Customer Communication

Formulation and maintenance of customer relationship management system had the highest mean score of 4.47. Other parameter that are highly outsourced in the manufacturing industry include; Customer service which scored a mean of 3.05, Receipt of customer complaints with a mean score of 1.147.Receipt of customer orders and Communication of order progress also scored low mean scores of 2.72 and 2.22. These findings are shown in Table 4.56.

Table 4. 56: Customer Communication

	N	Minimum	Maximum	Mean	Std. Deviation
Formulation and maintenance of customer relationship management	104	1	5	4.47	1.140
Receipt of customer complaints	103	1	5	2.83	1.147
Customer service	104	1	5	3.05	1.339
Receipt of customer orders	104	1	5	2.72	1.265
Communication of order progress	104	1	5	2.22	.903
Valid N (list wise)	103				

In relation to the outsourcing of customer communication 27% of the respondents indicated that its outsourcing would lead to timeliness. 14% indicated it would lead to increase in productivity. 18% of the respondents indicated that it would lead to low costs, respondents in the compliment indicated that it would lead to an increase in costs due to the improvement of direct cost payable to the agent. These low responses were attributed to the disconnect between the firm and its customers caused by the outsourcing agent. 51% of the respondents indicated that it would lead to high product quality but only if the complaints were used to provide feedback into the manufacturing operations on how to improve quality to meet customer expectations and eliminate their complaints. These findings are shown in figure Table 4.57.

These findings contradict those of Kalaignanam and Varadarajan (2011) who found out that it serves to highlight the potential cost savings that a business may be able to achieve by outsourcing of specific CRM-related processes and activities. These findings are similar to those of Thelen, Yoo, and Magnini (2011) who found that outsourcing of formulation, implementation and maintenance of CRM risks damage to the reputation of the firm. These findings also contradict those of Graf, Schlegelmilch, Mudambi and Tallman (2013) who find that CRM aspects outsourcing such as order management outsourcing results to the strategic fit of resources and capabilities. This study concludes that the outsourcing of receipt of customer complaints does not lead to the improvement of performance.

Table 4. 57: Outsourcing of Customer Communication

Performance Dimension	Frequency	Percentage (%)
Timeliness	28	27%
Productivity	15	14%
Low costs	19	18%
High product quality	53	51%

4.9.3. Internal Communication

The results indicated that most respondents agreed to the fact that their organization outsourced telephone communication as the parameter had the highest mean score of 4.2. The other activities were also outsourced to an extent. These include internet communication and optimization with a mean score of 4.18, written communication and visual communication with mean scores of 3.2 and 2.9 respectively. Data and information backup was also conducted in house as most of the organizations had a resident information technology department which took care of these services. These findings are shown in Table 4.58.

Table 4. 58: Internal Communication

	N	Minimum	Maximum	Mean	Std. Deviation
Telephone communication	103	1	5	4.20	.943
Internet communication	104	1	5	4.18	1.221
Written communication	104	1	5	3.02	1.115
Visual Communication	104	1	5	2.99	1.178
Valid N (list wise)	103				

In relation to the outsourcing of internal communication, 61% of the respondents indicated that it would lead to timeliness of communication. 53% of the respondents indicated that it would lead to increase in productivity due to effective communication. 83% said it would lead to lower costs. While 86% indicated that it would lead to high product quality. These findings are shown in Figure 4.13. These findings are similar to those of Ogunsanmi (2013) who found out that the main benefits for outsourcing communication were to reduce cost and infrastructure requirements that would have been necessary in setting a firms own systems, to improve flexibility for the business, a better match of resource supply to demand, access to better/more skills, effective use of staff, capacity on demand and access to advanced facilities. These findings are also

similar to those of Kinzer, Stefan and Kanda (2005) who found out that outsourcing of the internal communication requirements of a firm leads to improved focus of a firm, reduction of costs and companies can gain world class capabilities, This study concludes that the outsourcing of internal communication leads to improvement in the performance of a firm.

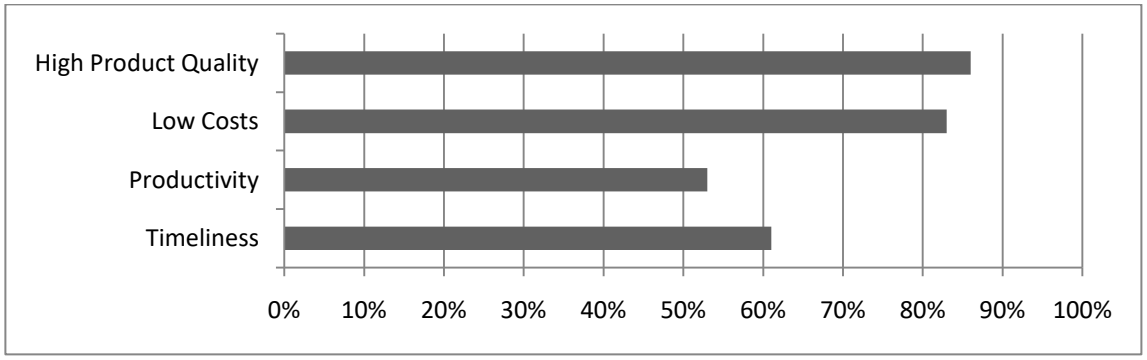

Figure 4. 13: Internal Communication Outsourcing

4.9.4. Competitor Communication

Partner competitors' communication was the parameter with the highest mean score of 3.34 with indirect competitors' communication and direct competitors communication having mean scores of 3.2 in each case. Replacement competitors' communication had a mean score of 3.07. Thus most organizations prefer to undertake their competitor communication via external agents as shown in table 4.59.

Table 4. 59: Competitor Communication Activities

	N	Minimum	Maximum	Mean	Std. Deviation
Direct competitors communication	104	1	5	3.24	1.347
Indirect competitors communication	104	1	5	3.20	1.118
Replacement competitors communication	104	1	5	3.07	1.039
Partner competitors communication	104	1	5	3.34	1.217
Valid N (list wise)	104				

Outsourcing of competitors' communication, 87% of the respondents indicated that its outsourcing would lead to timeliness of the competitors' communication process. 95% of the respondents indicated that its outsourcing would lead to increase in productivity due to the elimination of inhibition by the agent. Only 49% of the respondents indicated that its outsourcing would lead to low costs. 81% of the respondents indicated that outsourcing of direct competitors' communication would lead to better product quality. These findings are shown in Figure 4.14. These findings are in line with those of Görzig & Stephan (2002) who found out that outsourcing of communication to an external third party leads to increased business agility, lower expenses, provides improved customer experience and improved service quality. These findings also reflect those of Boyson, Corsi, Dresner, and Rabinovich. (2009) who found out that outsourcing competitors communication leads to leveraging economies of scale to access shared capacity, minimising capital investment, obtaining business improvements, gaining access to specialised capabilities, technology and resources that otherwise would have been difficult internally and providing as well as receiving a higher quality of information to and from competitors. This study concludes that the outsourcing of direct competitor communication leads to improvement in the performance of a firm.

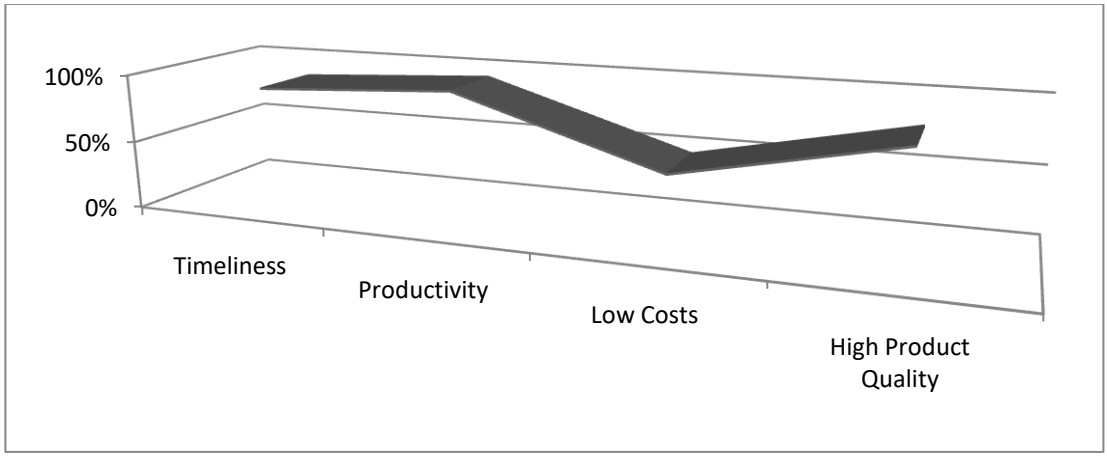

Figure 4. 14: Competitor Communication Outsourcing

4.9.5. Chi Square

In an effort to ascertain the significance of the association between the independent variables communication supply chain processes outsourcing and the dependent variable performance, a chi-square test was conducted. Table 4.60 indicates that, 82 organizations indicated that they outsourced their communication supply chain processes across the spectrum thus gaining a performance improvement of less than 50%. It was observed that twenty one (21) organizations that outsourced their communication supply chain processes across the spectrum gaining performance improvement greater than 50%. This is indicative that communication processes outsourcing has a relationship with performance.

Table 4. 60: Cross Tabulation of Communication Supply Chain Processes Outsourcing and Performance

Communication process * Performance Cross tabulation					
			performance		Total
			1%-50%	51%-100%	
Communication process	0%-20%	Count	8	1	9
		Expected Count	7	2	9
	21%-40%	Count	18	8	26
		Expected Count	21	5	26
	41%-60%	Count	32	7	39
		Expected Count	31	8	39
	61%-80%	Count	23	5	28
		Expected Count	22	6	28
	81%-100%	Count	1	0	1
		Expected Count	0	1	1
Total		Count	82	21	103
		Expected Count	82	21	103

Table 4.61 indicates that the calculated value of the Chi-Square statistic was 2.713 at 4 degrees of freedom. Because the significance level (0.009) is less than the threshold of 0.05, it can be clearly observed that there is a significant association between communication supply chain processes outsourcing and performance.

Table 4. 61: Chi-Square Tests between Communication Supply Chain Processes Outsourcing and Performance

Chi-Square Tests			
	Value		Asymp. Sig. (2-sided)
Pearson Chi-Square	2.713018	4	0.009
Likelihood Ratio	2.822415	4	0.008
Linear-by-Linear Association	0.304978	1	0.001
N of Valid Cases	103		
A	3 cells (30.0%) have expected count less than 5. The minimum expected count is .20.		

The association between was strong with a contingency value of 0.7601 which was statically significance sig=0.009 as shown in Table 4.62.

Table 4. 62: Symmetric Measures between Communication Processes Outsourcing and Performance

Symmetric Measures			
		Value	Approx. Sig.
Nominal by Nominal	Contingency Coefficient	0.7601	0.009
N of Valid Cases		103	
A	Not assuming the null hypothesis.		
B	Using the asymptotic standard error assuming the null hypothesis.		

4.9.6. Correlation

A simple Pearson's correlation was used to confirm the results of the regression analysis. All the tested variables were significant as all of them had a p value of 0.000. From the correlation analysis, it can be noted that communication supply chain processes outsourcing has a positive correlation with performance as the r value was 0.360 as shown in Table 4.63.

Table 4. 63: Correlation between Communication Supply Chain Processes Outsourcing and Performance

Correlations			
		Performance	Decision processes
Performance	Pearson Correlation	1.000	0.36
	Sig. (2-tailed)		0.742
	N	95.000	86.000
Decision processes	Pearson Correlation	0.36	1.000
	Sig. (2-tailed)	0.742	
	N	86.000	93.000

4.9.7. Regression Analysis between Communication Supply Chain Processes Outsourcing and Performance

Objective five tried to establish whether communication supply chain processes outsourcing had a significant effect on the performance of manufacturing firms in Kenya. This objective was tested by regressing communication supply chain processes outsourcing on performance guided by the equation $Y= \beta_0+\beta_1X$ where X represented communication process outsourcing and Y denoted Performance. The results of the regression are presented in Table 4.64.

Table 4.64 displays R (the correlation between the observed and predicted values of the dependent variable), which is .359. This is an average relationship between the observed and predicted values of the dependent variable. Table 4.99 also displays R squared which is the proportion of variation in the dependent variable explained by the regression model. In this case, it is .3295. This means that 32% of the variation performance (dependent variable) can be explained from outsourcing communication processes. The value of the standard error (sy/x) is shown in the output as .32 The regression was a fair fit describing 32.9% of the variance in communication process outsourcing R^2adj=31% this indicates only a slight overestimate with the model.

Table 4. 64: Model Summary for Communication Processes Outsourcing and Performance

Model Summary				
Model	R	R Square	Adjusted R Square	**Std. Error of the Estimate**
1	0.035993	0.3295	0.31059	**0.4436**
A	**Predictors: (Constant), Communication processes**			

Table 4.65 summarizes the results of an analysis of variance, with the sum of squares, degrees of freedom, and mean square being displayed for two sources of variation, regression and residual. For the accounted for values, the mean square (the sum of squares divided by the degrees of freedom), is 0.21, the F statistic (the regression mean square (MSR) divided by the residual mean square [MSE]) is 0.21 and the degree of freedom (df) is 1 whereas the output for residual which displays information about the variation that is not accounted for by the model has the following values: sum of squares as 16.533, df as 85 and a mean square of 0.189. The overall relationship was statistically significant ($F_{1, 85}$ =0.189, $p<0.05$) It has a significant level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship.

Table 4. 65: ANOVA between Communication Processes Outsourcing and Performance

ANOVA(b)						
Model		Sum of Squares		Mean Square	F	**Sig.**
1	Regression	0.21446	1	0.21446222	0.1896132	**0.001515**
	Residual	16.53323	84	0.196824176		
	Total	16.55468	85			
A	Predictors: (Constant), Communication processes					
B	**Dependent Variable: Performance**					

Table 4.66 represents coefficients of the independent variable and the dependent variable. It can be noticed from the significant column that the predictor is significant at 0.007 which is less than 0.05. It can be observed that every time communication supply chain processes outsourcing is increased by 1 unit, performance is improved by 0.11 units, when all other variables are held constant.

Table 4. 66: Coefficients for Communication Processes Outsourcing and Performance

Coefficients(a)						
Model		Unstandardized Coefficients		Standardized Coefficients	t	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	2.724	0.42		6.41	**0.007**
	Communication processes	0.110	0.33	0.03	0.330	**0.002**
A	**Dependent Variable: Performance**					

4.10. Performance of Manufacturing Firms

4.10.1. Timeliness

In this section, the study sought the respondents' responses regarding various aspects of timeliness that define performance. The respondents were expected to indicate the time measures for various supply chain activities for each year over a period of five years and the industry average or firm benchmark for the same activities. These year specific averages and benchmarks were used to calculate overall averages over the five year period. These five year averages of the industry/firm benchmark were expressed as percentages of the five year average of the supply chain activities times and classified into two categories. That is 0%-50% and 51%-100%. The lower the percentage the worse off a firm was in timeliness while the higher the percentage the better off a firm was in utilization of time. For ease of analysis the computed percentages were captured in a two point scale (2=51%-100% and 1= 0%-50%) and the general level of acceptance was determined by calculating the means and standard deviation for the various statements as per the responses and tabulated. The findings are shown on Table 4.67.

Table 4. 67: Timeliness

	N	Minimum	Maximum	Mean	Std. Deviation
Customer Delivery time	103	1	2	1.32	.469
Supplier delivery time	104	1	2	1.31	.464
Customers' queries response time	103	1	2	1.72	.418
Supplier response time	104	1	2	1.60	.460
Inventory processing time	102	1	2	1.88	.488
Valid N (list wise)	100				

The study revealed that the parameter that gave the firms improved performance over the rest was the inventory processing time as this parameter had the highest mean score of 1.88 in a two point scale. The other parameter that gave the organization a competitive edge was the customers' query response time as this parameter had a mean score of 1.72. Most organizations also excelled in suppliers' response time as this parameter scored 1.6. Supplier delivery time and customer delivery time had the lowest mean scores of 1.31 and 1.32 respectively.

4.10.2. Productivity

In this section, the study sought the respondents' responses regarding various aspects of productivity that define performance. The respondents were expected to indicate the productivity measures for various supply chain activities over a period of five years and the industry average or firm benchmarks for the same activities. These year specific averages and benchmarks were used to calculate overall averages over the five year period. These five year averages of the supply chain productivity measures of the firm were expressed as percentages of the five year industry/firm benchmark and classified into two categories. That is 0%-50% and 51%-100%. The lower the percentage the worse off a firm was in productivity while the higher the percentage the better off a firm was in productivity. For ease of analysis the computed percentages were captured in a two point scale (2=51%-100% and 1= 0%-50%) and the general level of acceptance was determined by calculating the means and standard deviation for the various statements as per the responses and tabulated. The findings are shown in Table 4.68.

Table 4. 68: Productivity

	N	Minimum	Maximum	Mean	Std. Deviation
Employee Productivity	104	1	2	1.26	.441
Conformity to product standards	103	1	2	1.46	.501
Productivity Standards achievement	103	1	2	1.20	.405
Capacity utilization	104	1	2	1.21	.410
Valid N (list wise)	102				

The study revealed the productivity was substantial with the most conspicuous characteristic being conformity to product standards as this parameter had the highest mean score of 1.46. Employee productivity had a mean score of 1.26. Mixed reactions were experienced about the achievement of productivity standards and capacity utilization as these parameters had the lowest mean scores of 1.20 and 1.21 in correspondingly.

This study deviates from the commonly accepted measures of firm productivity and adopts a supply chain focused measure of productivity as opposed to the traditionally established economics based measure such as the commonly accepted definition of productivity as a ratio of a volume measure of output to a volume measure of input use. It also avoids the common definitives of productivity such as technology, efficiency and real cost savings, benchmarking production processes and living standards. In support of the approach adopted for this study, Bartelsman and Doms (2000) state that there are many different productivity measures. The choice between them depends on the purpose of productivity measurement and, in many instances, on the availability of data.

4.10.3. Costs

In this section, the study sought the respondents' responses regarding various aspects of cost that define performance. The respondents were expected to indicate the cost measures for various supply chain activities over a period of five years and the industry average or firm benchmark for the same activities. These year specific averages and benchmarks were used to calculate overall averages over the five year period. These five year averages of the industry/firm benchmark were expressed as percentages of the five year average of the supply chain activities costs and classified into two categories, that is, 0%-50% and 51%-100%.

The lower the percentage the worse off a firm was in cost management while the higher the percentage the better off a firm was in cost management. For ease of analysis the computed percentages were captured in a two point scale (2=51%-100% and 1= 0%-50%) and the general level of acceptance was determined by calculating the means and standard deviation for the various statements as per the responses and tabulated. The findings are shown in Table 4.69.

Table 4. 69: Cost Rating

	N	Minimum	Maximum	Mean	Std. Deviation
Manufacturing costs	104	1	2	1.30	.460
Logistics costs	104	1	2	1.29	.455
ICT costs	104	1	2	1.37	.484
Human resources management costs	102	1	2	1.36	.483
Procurement costs	104	1	2	1.14	.353
Planning costs	104	1	2	1.49	.081
Coordination costs	104	1	2	1.25	.435
Monitoring costs	104	1	2	1.15	.363
Inventory management costs	104	1	2	1.18	.388
Communication costs	104	1	2	1.22	.417
Valid N (list wise)	102				

The study revealed that among the costs that were low were procurement, monitoring and inventory management costs. These parameters had the lowest mean scores of between 1.14 and 1.18. Coordinating and logistics costs were somewhat low as compared to other organizations as this parameter had the moderate mean scores of 1.25 and 1.29 respectively. Results also revealed that the manufacturing costs in Kenya were somewhat high a factor that was triggered by the high cost of energy as revealed by interviews conducted. Most manufacturing organizations in Kenya incurred high cost in Human resource management and ICT a factor that forced most of them to hire casual laborers as which was unreliable hence inconveniencing them further. Planning cost as a parameter had the highest mean score of 1.49 thus indicative to the fact that most organizations incurred a lot during planning phases of their endeavors.

This findings mirror those of Awade (2014) who found that performance focuses on cost leadership relative to competitors. Low cost relative to competitors is the theme running through the entire overall cost leadership strategy and the objective is clearly overall industry cost leadership. Attaining cost leadership typically requires aggressive construction of efficient scale facilities and vigorous pursuit of cost reductions through experience, tight cost and overhead control, avoidance of marginal customer accounts, and cost minimization in areas like R&D, service, sales force, advertising, etc.

4.10.4. Product Quality

The study sought the respondents' responses regarding various aspects of quality that define performance. The respondents were expected to indicate firstly the total number of units sold to customers and secondly the quality related complaints received in relation to the finished products sold to customers for each year over a period over a period of five years. These year specific averages and benchmarks were used to calculate overall averages over the five year period. The compliments of these five years averages were used to calculate percentages of products that met quality standards by expressing them as a fraction of the total units sold. These percentages were then

classified into two categories. That is 0%-50% and 51%-100%. The lower the percentage the worse off a firm was in quality while the higher the percentage the better off a firm was in product quality. For ease of analysis the computed percentages were captured in a two point scale (2=51%-100% and 1= 0%-50%) and the general level of acceptance was determined by calculating the means and standard deviation for the various statements as per the responses and tabulated. The findings are shown in Table 4.70.

Table 4. 70: Product Quality

	N	Minimum	Maximum	Mean	Std. Deviation
Product performance	103	1	2	1.11	.310
Extra product features	104	1	2	1.18	.388
Product reliability	104	1	2	1.33	.423
Conformance to customer expectations	103	1	2	1.29	.397
Product durability	104	1	2	1.27	.380
Valid N (list wise)	100				

Responses obtained were indicative to the fact that no company's products or services were rated below 50% as the mean scores were greater than 1.0. Keen consideration was to be taken on the general product performance as these parameter had a low mean score 1.11. The durability of Kenya products were put to the task as customer feedback did not paint a very bright perception with the parameter scoring a low mean score of 1.27 even though the products had extra features that customers did not expect. The customers were not disappointed as complains on the reliability and conformance to their expectations were low since these parameters scored the highest mean scores of 1.33 and 1.29.

Given that the respondents indicated each of the mentioned dimensions as being present to their products as per the customer feedback, then these findings may be compared to those of Galgano, (1994) who defined quality dimensions to be Performance, Features, Reliability, Conformance, Durability, Serviceability, Aesthetics and Perceived Quality, but these findings contrast those of Al-Saket (2003) who found out that quality is a multi-dimensional concept with keeping customer satisfaction as the focal point. They found the main quality dimensions in the manufacturing sector to be Operational Dimension, Reliability Dimension, Economical Dimension, Organisational Dimension, Social and Environmental Dimensions. This kind of quality is also termed positive quality.

4.11. Multiple Linear regression analysis

After analyzing each variable's effect on performance using simple regression, chi square and Pearson's correlation, a multiple regression analysis was conducted in order to establish the effects of all the variables combined on the independent variable**.** The formula $Y= \beta 0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4+\beta_5X_5+\varepsilon$ Where: Y= performance, β_0= Y intercept, X_1= primary supply chain processes outsourcing, X_2= Secondary supply chain processes outsourcing, X_3= steering supply chain processes outsourcing, X_4 = Decision supply chain processes outsourcing, X_5 = Communication/Information supply chain processes and ε= Error term. β_1, β_2, β_3, β_4 and β_5 represent the coefficient of each of the independent variables. Table 4.71 displays R (the correlation between the observed and predicted values of the dependent variable), which is .521. This is an average relationship between the observed and predicted values of the dependent variable.

Table 4.71 also displays R squared which is the proportion of variation in the dependent variable explained by the regression model. In this case, it is .511. This means that 51.1 % of the variation in performance (dependent variable) can be explained from a combination of the independent variables. The value of the standard error (sy/x) is

shown in the output as .796. The regression was a fair fit describing 51% of the variance in performance R^2adj=48.27% this indicates only a slight overestimate with the model.

Table 4. 71: Model Summary for Independent Variables and Performance

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.52188	0.5111085	0.482797187	0.79697782
A	Predictors: (Constant), Decision processes, Secondary processes, Steering processes, Communication processes, Primary processes.			

The overall relationship was statistically significant ($F_{1, 80}$ =13.609, $p<0.05$) It has a significant level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship as shown in Table 4.72.

Table 4. 72: ANOVA for Independent Variables and Performance

ANOVA(b)						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	51.837586	6	8.639597732	13.6019	0.000
	Residual	47.638023	75	0.635173645		
	Total	99.47561	81			
A	Predictors: (Constant), Decision processes, Secondary processes, Steering processes, Communication processes, Primary processes,					
B	Dependent Variable: Performance					

The coefficients at this point revealed different trends as compared to simple regression analysis. Primary processes outsourcing had the highest effect of 0.456 on performance followed by steering processes and secondary processes with beta values of 0.437 and 0.423 communication processes had a beta value of 4.19 whereas decision process outsourcing had the least beta values of 0.134. Thus yielding a regression model where $Y= 1.04+0.456X_1+0.423X_2+0.437X_3+0.419X_4+0.134X_5$ as shown in Table 4.73.

Table 4. 73: Coefficients for Independent Variables and Performance

Coefficients(a)						
Model		Unstandardized Coefficients		Standardized Coefficients	T	**Sig.**
		B	Std. Error	Beta		
1	(Constant)	1.04	1.257		0.827	**0.001**
	Primary processes	0.456	0.224	0.19	0.199	**0.003**
	Secondary processes	0.423	0.151	0.66	6.921	**0.000**
	Steering processes	0.437	0.18	0.52	0.517	**0.007**
	Communication processes	0.419	0.132	0.26	0.313	**0.005**
	Decision processes	0.134	0.632	0.017	0.212	**0.002**
A	**Dependent Variable: Performance**					

4.12. Hypotheses Testing on Model Parameters

The first objective of this study intended to determine the effect of primary processes outsourcing on the performance of manufacturing firms in Kenya. With the corresponding null hypothesis (H_0): primary supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya ($\beta_1=0$). The hypothesis test for significance of the predictor variables yields a P-value of 0.003 as per Table 4.73. This is less than the critical value of 0.05. Hence, the null hypothesis is rejected.

The second objective of this study aimed at establishing the effect of secondary processes outsourcing on the performance of manufacturing firms in Kenya. With the corresponding null hypothesis (H_0): secondary supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya ($\beta_2=0$). The hypothesis test for significance of the predictor variables yields a P-value of 0.000 as per Table 4.73. This is less than the critical value of 0.05. Hence the null hypothesis is rejected.

The third objective of this study intended to examine the effect of steering processes outsourcing on the performance of manufacturing firms in Kenya. With the corresponding null hypothesis (H_0): steering supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya ($\beta_3=0$). The hypothesis test for significance of the predictor variables yields a P-value of 0.007 as per Table 4.73. This is less than the critical value of 0.05. Hence the null hypothesis is rejected.

The fourth objective of this study intended to determine the effect of decision processes outsourcing on the performance of manufacturing firms in Kenya. With the corresponding null hypothesis (H_0): decision supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya ($\beta_4=0$). The results of the hypothesis test for significance of the predictor yields a P-value of 0.002 as per Table 4.73. This is less than the critical value of 0.05. Therefore the null hypothesis is rejected.

The fifth objective of this study intended to assess the effect of communication supply chain processes outsourcing on the performance of manufacturing firms in Kenya. With the corresponding null hypothesis (H_0): communication supply chain processes outsourcing has no significant effect on the performance of manufacturing firms in Kenya ($\beta_5=0$). The results of the hypothesis test for significance of the predictor yields a P-value of 0.005 as per Table 4.73. This is less than the critical value of 0.05. Therefore this null hypothesis is rejected.

4.13. Optimal Regression Model

From Table 4.73 all the P values for the independent variables are less than 0.05. This means that all the independent variables are significant. Therefore no independent variable is dropped in the optimal model. The optimal regression model is therefore $Y=1.04+0.456X_1+0.437X_2+0.423X_3+0.419X_4+0.134X_5$.Where Y represents performance while X_1, X_2, X_3, X_4 and X_5 represent primary processes, steering processes, secondary processes, communication processes and decision processes respectively. This optimal regression model informs the revised conceptual framework shown in figure 4.15.

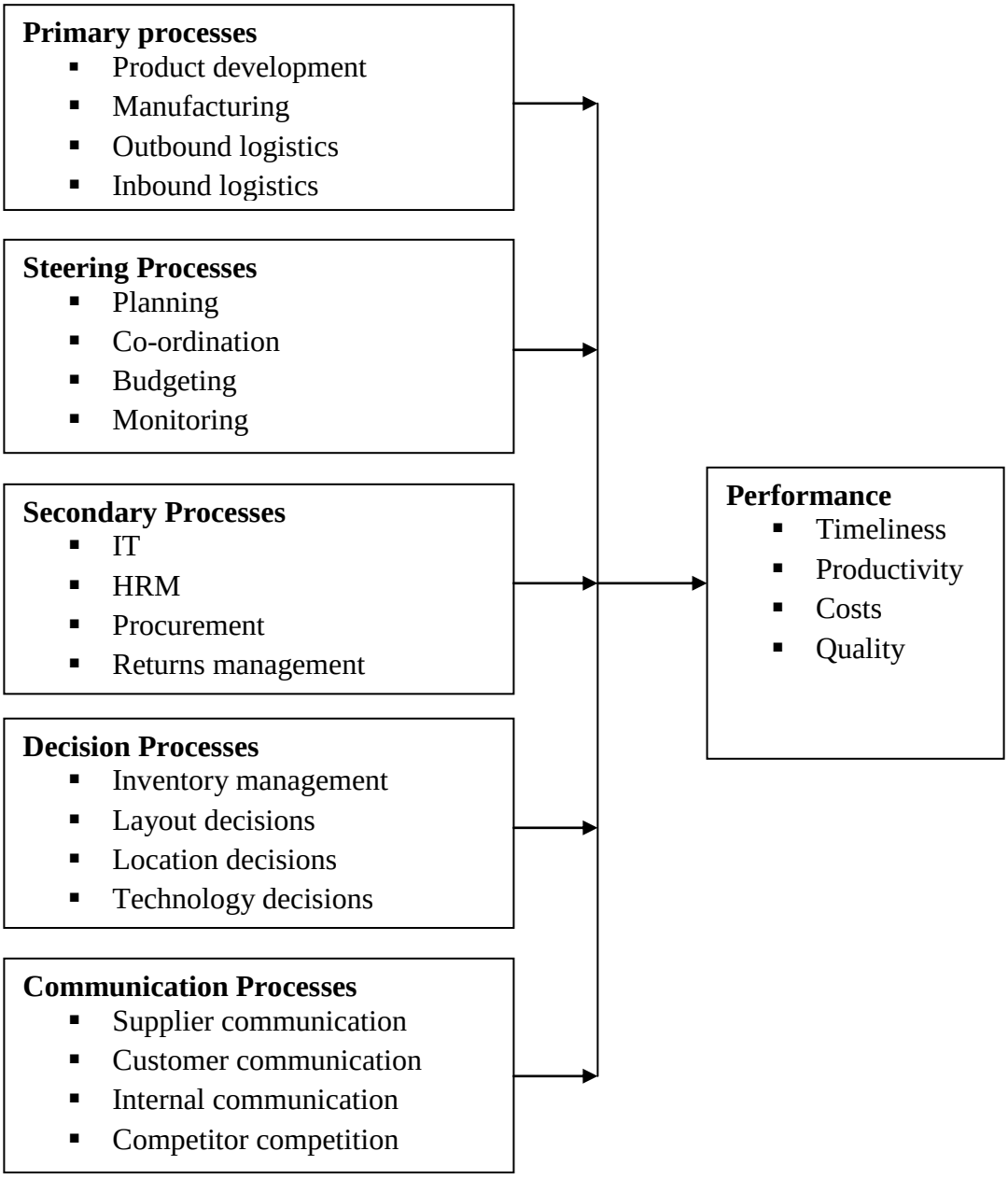

Figure 4. 15: Revised Conceptual Framework

CHAPTER FIVE

SUMMARY OF THE FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1. Introduction

This chapter provides the summary of the major findings and gives the conclusions and recommendations of the study. The chapter is organized as follows. It starts with the summary of the major findings, conclusions, recommendations and eventually areas for further research. The general objective of this study was to examine the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The study was guided by the following specific objectives

1. To determine the effect of primary supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
2. To establish the effect of secondary supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
3. To examine the effect of steering supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
4. To determine the effect of decision supply chain processes outsourcing on the performance of manufacturing firms in Kenya.
5. To assess the effect of communication supply chain processes outsourcing on the performance of manufacturing firms in Kenya.

5.2. Summary of the Major Findings

A multi-linear regression analysis of the independent variables against the dependent variable was conducted and a model summary showed that it was statistically significant with an R squared of 0.511. This means that 51.1 % of the variation in performance (dependent variable) can be explained from a combination of the independent variables.

The overall relationship was statistically significant ($F_{1, 80}$ =13.609, p<0.05) It has a significant level of 0.000 this means that the chances are zero that the result of regression model are due to random events instead of a true relationship.

Hypothesis test for the significance of the predictors established that all the independent variables were significant predictors of the performance of manufacturing firms. This was informed by the fact that all the calculated P-values were less than the critical value of P=0.05. The calculated p-values were as follows: primary supply chain processes (p=0.003), secondary supply chain processes (p=0.000), steering supply chain processes (p=0.007), decision supply chain processes (p=0.005) and communication supply chain processes outsourcing (p=0.002). Hence, leading to the rejection of all null hypotheses.

5.2.1. Effect of Primary Supply Chain Processes Outsourcing on the Performance of Manufacturing Firms in Kenya.

The study sought to determine the effect of primary supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The study found out that inbound logistics was the most outsourced primary process with a mean of 3.13 followed by outbound logistics with a mean of 3.02 and eventually product development and manufacturing with means of 2.8 and 2.7 respectively. With regards to effect on the performance of the firm manufacturing outsourcing had the highest positive effect on the improvement of performance, followed by inbound logistics and outbound logistics and product development. From the results of multi-linear regression analysis, an increase in outsourcing of primary supply chain processes by one unit leads to an improvement in supply chain performance by 45%.

5.2.2. Effect of Secondary Supply Chain Processes Outsourcing on the Performance of Manufacturing Firms in Kenya.

The study sought to effect of secondary supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The study found out that ICT and returns management were the most outsourced secondary supply chain processes with a mean of 3.2. HRM was outsourced to a mean of 3.06 while procurement management activities was the least outsourced secondary supply chain processes with a mean of 2.81. From the findings the study revealed that HRM outsourcing had the highest effect on the improvement of the performance of manufacturing firms in Kenya. ICT had the second highest predictive effect on improvement of performance, procurement management and finally returns management, which had the least effect on the improvement of the performance of the firm. From the results of multi-linear regression analysis, an increase in outsourcing of secondary supply chain processes by one unit leads to an improvement in supply chain performance by 42.3%.

5.2.3. Effect of Steering Supply Chain Processes Outsourcing on the Performance of Manufacturing Firms in Kenya.

This study sought to examine the effect of steering supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The study found out that monitoring was the most outsourced function with a mean 3.19 followed by budgeting, monitoring and coordination with respective means of 3.02, 2.8 and 2.7. With respect to the effect on the performance improvement of the firm planning outsourcing has the most causal effect, followed by budgeting, monitoring and finally the outsourcing of coordination has the least effect on the improvement of the performance. From the results of multi-linear regression analysis, an increase in outsourcing of steering supply chain processes by one unit leads to an improvement in supply chain performance by 43.7%.

5.2.4. Effect of Decision Supply Chain Processes Outsourcing on the Performance of Manufacturing Firms in Kenya.

The study sought to determine the effect of decision supply chain processes outsourcing on the performance of manufacturing firms in Kenya. The study found out that layout decisions were the most outsourced among the decision processes with a mean of 3.3. It was followed by the outsourcing of technology decisions with a mean of 3.13, the outsourcing of inventory management with a mean of 2.7 and eventually location decisions with a mean 2.6. Layout decisions outsourcing was found to have the most positive effect followed by location decisions outsourcing and inventory management decisions outsourcing at the same level with the outsourcing of technology decisions having the least effect as per the study. From the results of multi-linear regression analysis, an increase in outsourcing of decision supply chain processes by one unit leads to an improvement in supply chain performance by 13.4%.

5.2.5. Effect of Communication Supply Chain Processes Outsourcing on the Performance of Manufacturing Firms in Kenya.

The study sought to assess the effect of communication processes outsourcing on the performance of manufacturing firms in Kenya. The study found out that internal communication was the most outsourced communication function with a mean of 3.6 followed by a tie between supplier communication and competitor communication with means of 3.2 each. The least outsourced activity being customer communication with a mean of 3.0. As pertains the effect of outsourcing of these activities on the performance of the firms, competitor communication outsourcing was found to have the most effect followed by internal communication, supplier communication and customer communication respectively. From the results of multi-linear regression analysis, an increase in outsourcing of communication supply chain processes by one unit leads to an improvement in supply chain performance by 41.9%.

5.3. Conclusions

The general objective of this study was to examine the effect of supply chain processes outsourcing on the performance of manufacturing firms in Kenya. From the findings of this study it is concluded that majority of supply chain processes are outsourced in most manufacturing organizations in Kenya. Past studies and theoretical perspectives have been inconclusive on the topic of supply chain processes outsourcing and performance, in general and specifically, in relation to the manufacturing sector.

From the findings of the multi-linear regression analysis, this study concludes that the most important factor in improving the performance of a firm is the outsourcing of primary processes. The second most influential factor in influencing the performance of a supply chain is the outsourcing of steering processes followed by the outsourcing of secondary supply chain processes and communication processes respectively. The outsourcing of decision processes has the least effect on the improvement of supply chain processes. Overall, this study concludes that if a firm is keen on improving its supply performance it should outsource all of its supply chain processes but only those functions of the various supply chain processes whose outsourcing leads to the significant improvement of its performance while those activities within the supply chain processes whose outsourcing does not lead to the improvement of the performance should be undertaken in-house.

5.4. Recommendations

From the findings of this study on the specific supply chain processes this study recommends that if a firm intends to improve its performance by outsourcing it primary supply chain processes it should outsource its manufacturing activities, inbound logistics and outbound logistics which provides substantial improvements to the performance. Product development should be undertaken in-house since the consequent gains in performance arising from its outsourcing are minimal.

In order to improve a manufacturing firm's performance as a result of outsourcing its secondary supply chain processes, the firm should only outsource its HRM, procurement management and ICT. From the findings returns management outsourcing would not yield a substantial improvement in performance. With regards to steering supply chain processes the firm should outsource it's planning and budgeting functions only since it will yield a substantial improvement in performance. While coordination and monitoring activities should be undertaken in-house since their outsourcing will not yield substantial improvement in performance.

From the findings of the study it is recommended that if a firm intends to improve its performance by outsourcing its decision processes, it should only outsource its layout decisions, location decisions and inventory management decisions. Technology decisions should not be outsourced. In outsourcing the communication processes in order to improve performance, the firms should outsource internal communication, competitor communication, and supplier communication while conducting customer communication in-house.

5.4.1. Implications to practice

This study has conclusively indicated that outsourcing of supply chain processes improves the performance of manufacturing firms. Primary supply chain processes outsourcing, secondary supply chain processes outsourcing, steering supply chain processes outsourcing, decision supply chain processes outsourcing and communication supply chain processes outsourcing have been established as key predictors of performance. The management of manufacturing firms must therefore strategically link the supply chain processes outsourcing to superior performance. Furthermore, the findings reveal that primary supply chain processes outsourcing has the highest predictive effect on performance improvement.

Furthermore findings indicate that overall outsourcing of supply chain processes should be avoided in order to ensure that performance is optimally improved. Management should therefore be keen in identifying the specific activities to be outsourced in order to find the optimal mix of outsourcing candidates. This is necessary for firms to establish and maintain performance improvement over time. The implication to practice in this case is that firms should strive to ensure that they only outsource those supply chain functions whose outsourcing leads to the improvement of their performance and not opt for outsourcing in pursuit of imitative behavior of competitors and other firms.

5.4.2. Implications to Theory and Knowledge

The study has proven that supply chain processes, outsourcing and performance phenomena in Kenya can be rationalized using various outsourcing theories models and frameworks developed elsewhere, mostly in the first world. This study was primarily based on the Klejn and Rorink (2012) model of supply chain processes. This study showed that the supply chain processes of manufacturing firms based in Kenya, or any other developing country for that matter can also be broken down into the five categories which were expounded to therein. The implication is that supply chain models theories and frameworks developed elsewhere are also applicable to firms in developing countries with minimal or no modification at all. In addition additional theories frameworks and models adopted in this study have shown that the specific activities encompassed within the broader supply chain processes are also found within firms in the developing countries such as Kenya.

Models such as Porter's (1985) Value chain model and the Klejn and Rorink (2012) model have provided the key activities considered in this study as primary supply chain processes as well as the secondary supply chain processes. The GSCF framework by Lambert et al (1998) was instrumental in this study in helping to establish the steering processes for this study. The SSCM model was instrumental in establishing the various activities that comprise the decision of a firm. Finally models such as the Aristotle

model, Laswell's model, Schram model as well as the Berlo model provided the foundation for establishment of the supply chain activities in the communication category. The implication is that the various theories models and frameworks which develop supply chain activities under each category of supply chain processes are also applicable to firms in Kenya and by extension firms in developing economies such as Kenya.

5.5. Areas for Further Research

As per the responses of the obtained from the respondents in line with the topic of supply chain processes outsourcing and the improvement of performance the following areas were deemed appropriate for future research: Gain sharing in outsourcing relationships is an area which should be researched.

Outsourcing agents' decision criteria is of key importance to find out what factors firms looking to outsource look for in probable outsourcing agents as well as the attributes that are given weight in such a situation. This would help new firms looking to outsource in understanding what to look for as well provide outsourcing agents with information on how to package themselves.

Maintenance of continuous performance arising from outsourcing relationships should be researched into. This is attributed to the fact that once performance improvement has been obtained by the firm through an outsourcing relationship it could easily be eroded by competitors through imitative behavior, therefore research should be conducted into how such a firm can make the performance improvement derived from outsourcing sustainable.

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APPENDICES

Appendix 1: Introduction Letter

DENIS KAMAU MUTHONI
P.O. BOX 3924
THIKA
September 19, 2014

Dear Respondent

RE: Collection of Data

I am a Doctor of Philosophy (Supply Chain Management) student at JKUAT Nairobi CBD campus, currently undertaking my research for my thesis in partial requirement for the award. My research topic is **The Effect of Supply Chain Processes Outsourcing on the Performance of Manufacturing Firms in Kenya.** I am happy to inform you that you have been selected to be a respondent in this study. For ease of response you are allowed to refer to any documentation, reference material, or individuals both within and outside your firm. You can also seek clarification from the researcher/research assistants on any unclear issues in the questionnaire who will be present as you fill the questionnaire. Your responses will be used for academic purposes only and will be treated confidentially. Your identity will not be revealed. Your co-operation will be highly appreciated. Thank you.

Yours Sincerely

DENIS KAMAU MUTHONI

Appendix 2: Questionnaire

SECTION I: BACKGROUND INFORMATION

Name of organization……
Department……
Designation……

Tick the appropriate box

1 (a) Gender Male ☐ Female ☐

1 (b) Years of Experience 1-5 ☐ 6-10 ☐

11-15 ☐ over 15 ☐

1(c) Highest qualification Certificate ☐ Diploma ☐

Bachelor's degree ☐ Master's degree ☐

PhD ☐ Other ☐

Specify……

SECTION 2: PRIMARY PROCESSES

2(a). Kindly answer the following questions for each year to the best of your knowledge in relation to product development in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many new product ideas were generated by your firm?					
b	How many of the new product ideas were generated externally?					
2a	How many new product ideas were screened?					
b	How many new product ideas were screened externally?					
3a	How many new products were prototyped during the year?					
b	How many new products were prototyped externally?					
4a	How many new products were test marketed during the year?					
b	How many new products were test marketed by external third parties on behalf of the firm?					
5a	How many new products were launched					

	during the year?					
b	How many new products were launched by external third parties on behalf of the firm?					

2(b). Kindly answer the following questions for each year to the best of your knowledge in relation to manufacturing in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	What is the volume of raw materials processed during the year? (use appropriate units)					
b	What volume of raw materials were processed by external third parties? (use appropriate units)					
2a	How many units of were formed during the year					
b	How many units were formed by external third parties on behalf of the firm?					
3a	How many units were assembled during the year?					
b	How many units were assembled by external third parties?					
4a	How many units were conditioned during the year?					
b	How many units were conditioned by external third parties during the year?					
5a	How many products were finished during the year?					
b	How many products were finished by external third parties during the year on behalf of the firm?					

2(c). Kindly answer the following questions for each year to the best of your knowledge in relation to outbound logistics in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many customer service standards were set during the year					
b	How many of the customer service level standards were set by external third parties on behalf of the firm					
2a	What is the total number of finished goods that were warehoused during the year?					
b	What is the total number of finished goods that were warehoused by external third					

	parties on behalf of the firm					
3a	How many carriers and routes were selected during the year					
b	How many carriers and routes were selected by external third parties on behalf of the firm?					
4a	What is the number of equipment that was selected by the firm for use during the year					
b	What number of the selected equipment was selected by external third parties on behalf of the firm					

2(d). Kindly answer the following questions for each year to the best of your knowledge in relation to inbound logistics in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	What is number of shipments that were consolidated during the year?					
b	What is the number of shipments that were consolidated by external third parties during the year					
2a	What is the monetary value of claims that were processed during the year?					
b	What is the monetary value of claims that were processed by external third parties on behalf of the firm					
3a	What is the number of inbound shipment activities that were received during the year?					
b	What number of inbound shipment activities were carried out by external third parties on behalf of the firm					
4a	What is the value of orders that were received and processed by the firm during the year?					
b	What is the value of order that were received and processed by external third parties on behalf of the firm					

2(e). Kindly highlight how outsourcing of the following primary supply chain activities affects the performance attributes below

Activity	**Timeliness**	**Productivity**	**Low costs**	**High product quality**
Idea generation				
Product idea screening				
Prototyping				
Test Marketing				
Product launch				
Product design				
Raw material processing				
Forming/assembly				
Conditioning				
Finishing				
Setting customer service level and standards				
Finished goods Warehousing				
Carrier selection and routing				
Equipment selection				
Freight consolidation				
Claims processing				
Inbound shipment activities				
Order management				

SECTION 3: SECONDARY PROCESSES

3(a). Kindly answer the following questions for each year to the best of your knowledge in relation to ICT in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many software were developed for the firm or acquired by the firm during the year?					
b	How many software were developed by (or acquired from) external third parties on behalf of the firm?					
2a	How many hardware maintenance and network optimizations were undertaken during the year?					
b	How many hardware maintenance and network optimizations were undertaken by external third parties on behalf of the firm?					

3a	What is the monetary value that was spent on network management during the year?					
b	What is the monetary value spent on network management that was paid to external third parties?					
4a	What monetary value was spent on database management during the year?					
b	How much was paid to external parties for database management?					
5a	How much space in giga bytes was required for data and information backup?					
b	How much of the space in giga bytes required for data and information backup was obtained from external third parties?					

3(b). Kindly answer the following questions for each year to the best of your knowledge in relation to human resources management in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many recruitments were conducted during the year?					
b	How many rectruitments were conducted by external third parties on behalf of the firm?					
2a	How many individuals were selected to join the firm's workforce during the year?					
b	How many individuals were selected to join the firm's workforce by external third parties on behalf of the firm?					
3a	How much time was spent on training employees during the year?					
b	How much of the training time was taken up by external third parties training employees on behalf of the firm?					
4a	How many staff appraisals were conducted during the year?					
b	How many staff appraisal were conducted by external third parties on behalf of the firm?					
5a	How much was spent on staff remuneration during the year?					
b	How much of the amount spent on staff remuneration was determined by external third parties on behalf of the firm?					

3(c). Kindly answer the following questions for each year to the best of your knowledge in relation to procurement in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many suppliers were identified to meet the needs of the firm during the year?					
b	How many suppliers were identified to meet the needs of the firm by external third parties on behalf of the firm?					
2a	How many suppliers were evaluated during the year?					
b	How many suppliers were evaluated by external third parties on behalf of the firm during the year					
3a	How many negotiations were conducted during the year?					
b	How many negotiations were carried out by external third parties on behalf of the firm					
4a	How many contracts did the firm have during the year?					
b	How many contracts were managed by external third parties on behalf of the firm?					

3(d). Kindly answer the following questions for each year to the best of your knowledge in relation to returns management in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many returns were received during the year?					
b	How many returns were received during the year by external third parties on behalf of the firm?					
2a	What amount was spent on inspection on returns during the year?					
b	How much of the amount spent on inspection was paid to external third parties for inspecting returns?					
3a	How much was spent on shipping returns to the firm from customers?					
b	How much was paid to external third parties for shipping returns from customers to the firm					
4a	How many returns were declared as scrap during the year?					

b	How many returns were declared as scrap by external third parties on behalf of the firm?					

3 (e) Kindly highlight how outsourcing of the following secondary supply chain activities affects the performance attributes listed below

Activity	**Timeliness**	**Productivity**	**Low costs**	**High product quality**
Software design				
Hardware maintenance and optimization				
Network management				
Database management				
Data and information backup				
Recruitment				
Selection				
Training				
Staff appraisal				
Reward management				
Supplier identification				
Supplier evaluation				
Negotiations				
Order placement				
Contract management				
Returns receipt				
Returns inspection				
Returns shipment				
Returns scrap declaration				

SECTION 4: STEERING FUNCTIONS

4(a). Kindly answer the following questions for each year to the best of your knowledge in relation to planning in your firm

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many environmental assessment were conducted during the year?					
b	How many environmental assessments were conducted by external third parties on behalf of the firm?					
2a	How many objectives/goals were set by the firm during the year?					
b	How many goals/objectives were set by					

	external third parties on behalf of the firm					
3a	How many strategies were formulated during the year?					
b	How many strategies were formulated by external third parties on behalf of the firm					
4a	How many strategies were implemented during the year?					
b	How many strategies were implemented by external third parties on behalf of the firm?					
5a	How many evaluations were conducted during the year?					
b	How many evaluations were conducted by external third parties on behalf of the firm?					

4(b). Kindly answer the following questions for each year to the best of your knowledge in relation to coordination in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many resources were shared in the supply chain?					
b	How many of the shared resources were obtained from external third parties?					
2a	How many joint forecasting activities were undertaken in the firm during the year?					
b	How many joint forecasting activities were undertaken by external third parties on behalf of the firm?					
3a	How many decisions were made jointly in the firm during the year					
b	How many of the joint decisions were made by external third parties on behalf of the firm					
4a	How many supply chain partnerships were established during the year?					
b	How many supply chain partnerships were established by external third parties on behalf of the firm?					

4(c). Kindly answer the following questions for each year to the best of your knowledge in relation to budgeting in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How much was spent on gathering budgeting data during the year?					
b	How much was paid to external third parties					

	for gathering budgeting data on behalf of the firm?					
2a	How many estimates were developed for the budgeting process?					
b	How many estimates were developed by external third parties on behalf of the firm for the budgeting process?					
3a	How many budgets were developed during the year?					
b	How many budgets were developed by external third parties on behalf of the firm?					
4a	How much was spent on the evaluation of the budgets?					
b	How much was paid to external third parties for the evaluation of the budget					

4(d). Kindly answer the following questions for each year to the best of your knowledge in relation to monitoring activities in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many supply chain indicators were selected for monitoring during the year?					
b	How many supply chain indicators for monitoring were selected by external third parties on behalf of the firm?					
2a	How many performance baselines were established during the year?					
b	How many performance baselines were established by external third parties on behalf of the firm?					
3a	How much was paid for the collection of supply chain monitoring and evaluation data?					
b	How much was paid to external third parties for the collection of supply chain monitoring and evaluation data					
4a	How much was spent on the analysis of supply chain monitoring and evaluation data					
b	How much was paid to external third parties for the analysis of supply chain monitoring and evaluation data					
5a	How much was spent on knowledge sharing on supply chain monitoring?					
b	How much was paid to external third parties					

	for knowledge sharing on supply chain monitoring?					

4(e). Briefly highlight how outsourcing of each of the following supply chain steering activities affects the performance attributes listed in the cross-tabulation below

Activity	**Timeliness**	**Productivity**	**Low costs**	**High product quality**
Environmental assessment				
Goal/objective setting				
Strategy formulation				
Budgeting				
implementation				
Evaluation				
Resource sharing				
Joint forecasting				
Joint decision making				
Establishment of supply chain partnerships				
Selection of supply chain indicators to monitor				
Establishment of performance baselines				
Collection of supply chain monitoring and evaluation data				
Analysis and evaluation of supply chain monitoring data				
Knowledge sharing on supply chain monitoring				
Gathering budget data				
Development of estimates				
Budget development				
Budget evaluation				

SECTION 5: DECISION PROCESSES

5(a). Kindly answer the following questions for each year to the best of your knowledge in relation to inventory management in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many inventory management policies were formulated during the year?					
b	How many inventory management policies were formulated by external third parties on behalf of the firm?					
2a	How many sales forecasts were developed during the year?					
b	How many sales forecasts were developed by external third parties on behalf of the firm?					
3a	How many product mixes were developed during the year?					
b	How many product mixes were developed by external third parties on behalf of the firm?					
4a	What is the number and size of stocking points formulated during the year?					
b	What is the number and size of stocking points formulated by external third parties on behalf of the firm?					
5a	How many inventory layout and dock designs were formulated during the year?					
b	How many inventory layout and dock designs were formulated by external third parties on behalf of the firm?					

5(b). Kindly answer the following questions for each year to the best of your knowledge in relation to layout decisions in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many product and process operations were analysed during the year?					
b	How many product and process operations were analysed by external third parties on behalf of the firm					
2a	How many machine requirements were determined during the year?					
b	How many machine requirements were determined by external third parties on					

	behalf of the firm?					
3a	How many workflows were determined during the year?					
b	How many workflows were determined by external parties on behalf of the firm?					
4a	How many material flows were determined during the year?					
b	How many material flows were determined by external third parties on behalf of the firm?					
5a	How many evaluations of layout design were carried out during the year?					
b	How many evaluations were carried out by external third parties on behalf of the firm?					

5(c). Kindly answer the following questions for each year to the best of your knowledge in relation to location in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many location objectives were defined during the year?					
b	How many location objectives were defined by external third parties on behalf of the firm?					
2a	How many location constraints were defined during the year?					
b	How many location constraints were defined by external third parties on behalf of the firm?					
3a	How many location decision criteria were identified during the year?					
b	How many location decision criteria were identified by external third parties during the year?					
4a	How much was spent on location data collection and analysis?					
b	How much was paid to external third parties for location data collection and analysis?					
5a	How many locations were selected for the firm's operation during the year?					
b	How many locations were selected by external third parties on behalf of the firm?					

5(d). Kindly answer the following questions for each year to the best of your knowledge in relation to technology decisions in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many manufacturing technology decisions were made in the firm during the year?					
b	How many manufacturing technology decisions were made by external third parties on behalf of the firm?					
2a	How many transportation technology decisions were made in the firm during the year?					
b	How many transportation technology decisions were made by external third parties on behalf of the firm?					
3a	How many warehousing technology decisions were made in the firm during the year?					
b	How many warehousing technology decisions were made by external third parties on behalf of the firm?					
4a	How many communication technology decisions were made in the firm during the year?					
b	How many communication technology decisions were made by external thirds parties on behalf of the firm?					

5(e). Briefly highlight how outsourcing of the following supply chain decision activities affects the performance attributes listed below

Activity	**Timeliness**	**Productivity**	**Low costs**	**High product quality**
Formulation of inventory management policies				
Sales forecasting				
Product mix at stocking points				
Number and size of stocking points				
Inventory layout and dock design				
Analysis of product and process operations				

Determination of machinery requirements				
Determination of workflow				
Determination of materials flow				
Implementation and evaluation of layout design				
Definition of location objectives				
Definition of location constraints				
Identification of the relevant decision criteria				
Location data collection and analysis				
Manufacturing technology				
Transportation technology				
Warehousing technology				
Communication technology				

SECTION 6: COMMUNICATION PROCESSES

6 (a). Kindly answer the following questions for each year to the best of your knowledge in relation to supplier communication in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many policies in relation to supplier relationship management were formulated and implemented during the year?					
b	How many policies in relation to supplier relationship management were formulated and implemented by external third parties on behalf of the firm?					
2a	How much was spent on supplier database maintenance?					
b	How much was paid to external third parties with respect to supplier database maintenance?					
3a	How many supplier feedbacks were acquired during the year?					
b	How many supplier feedbacks were acquired by external third parties on behalf of the firm?					
4a	How much was spent on supplier performance rating and communication					

	during the year?					
b	How much was paid to external third parties for supplier performance rating and communication?					
5a	How many supplier communications were received during the year?					
b	How many supplier communications were received by external third parties on behalf of the firm?					

6 (b). Kindly answer the following questions for each year to the best of your knowledge in relation to customer communication in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many policies were formulated and maintained in relation to customer relationship management during the year?					
b	How many policies in relation to customer relationship management were formulated and maintained by external third parties on behalf of the firm?					
2a	How many customer complaints were received during the year?					
b	How many customer complaints were received by external third parties on behalf of the firm?					
3a	How many customer service activities were undertaken during the year?					
b	How many customer service activities were undertaken by third parties on behalf of the firm?					
4a	How many orders were received during the year?					
b	How many orders were received by external third parties on behalf of the firm?					
5a	How many order progress communications were made during the year?					
b	How many order progress communications were made by external third parties on behalf of the firm?					

6c. Kindly answer the following questions for each year to the best of your knowledge in relation to internal communication in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How much was spent on telephone communication during the year?					
b	How much was paid to external third parties for telephone communication within the firm?					
2a	How much was spent on internet communication during the year?					
b	How much was paid to external third parties for internet communication					
3a	How much was spent on written communication within the firm during the year?					
b	How much was paid to external third parties for provision of written communication services within the firm?					
4a	How much was spent on visual communication within the firm during the year?					
b	How much was paid to external third parties for provision of visual communication services within the firm					

6d**.** Kindly answer the following questions for each year to the best of your knowledge in relation to competitor communication in your firm.

	Question	**2010**	**2011**	**2012**	**2013**	**2014**
1a	How many direct competitors did the firm communicate with during the year?					
b	How many direct competitors did the firm communicate with through external third parties?					
2a	How many indirect competitors did the firm communicate with during the year?					
b	How many indirect competitors did the firm communicate with through external third parties					
3a	How many replacement competitors did the firm communicate with during the year?					
b	How many replacement competitors did the firm communicate with via external third parties?					

4a	How many partner competitors did the firm communicate with during the year					
b	How many partner competitors did the firm communicate with through external third parties					

6 (e). Briefly explain how outsourcing of the following supply chain communication activities leads to the achievement of the listed performance attributes listed below

Activity	**Timeliness**	**Productivity**	**Low costs**	**High product quality**
Formulation, implementation and maintenance of supplier relationship management				
Supplier database maintenance				
Supplier feedback acquisition				
supplier performance and rating communication				
Supplier communication receipt				
Formulation and maintenance of customer relationship management				
Receipt of customer complaints				
Customer service				
Receipt of customer orders				
Communication of order progress				
Vertical communication				
Horizontal communication				
Telephone communication				
Internet communication				
Direct competitor communication				
Indirect competitor communication				
Generic competitor communication				
Form competitor communication				

SECTION 7: PERFORMANCE

7 (a) Kindly answer the following questions for each year to the best of your knowledge in relation to the following time related variables in your firm.

Time	**2010**	**2011**	**2012**	**2013**	**2014**
What was the average customer delivery time?					
What was the average industry customer delivery time/firm benchmark?					
What was the average supplier delivery time?					
What was the average industry supplier delivery time/firm benchmark?					
What was the average customer queries response time?					
What was the average industry customer queries response time/firm benchmark?					
What was the average supplier response time?					
What was the average industry supplier response time/firm benchmark?					
What was the average inventory processing time?					
What was the average industry inventory processing time/ firm bench mark?					

7 (b). Kindly answer the following questions for each year to the best of your knowledge in relation to productivity in your firm.

Resources	**2010**	**2011**	**2012**	**2013**	**2014**
What was the average workforce productivity per employee per annum (use appropriate units)					
What was the industry average workforce productivity per employee per annum/ firm benchmark?					
How many products of output conformed to established product standards per 100 units?					
What was the established industry average product output conformity to standards per 100 units/firm benchmark?					
How many productivity targets were achieved during the year					
What was the industry benchmark for the achievement of productivity targets/firm benchmark?					

What was the average capacity utilization during the year?					
What was the average industry capacity utilization/firm benchmark?					

7 (c). Kindly answer the following questions for each year to the best of your knowledge in relation to competitor communication in your firm.

Costs	**2010**	**2011**	**2012**	**2013**	**2014**
How much was the average manufacturing cost per unit					
How much is the industry average manufacturing costs per unit/firm benchmark?					
How much was the average logistics cost per shipment					
How much was the industry average logistics cost per shipment/ firm benchmark?					
How much was the total ict costs?					
How much was the industry average total ict costs per annum/firm benchmark per annum?					
How much was the total human resources management costs?					
How much was the industry average total human resources management cost per annum?					
How much was the total Procurement costs					
How much was the industry average total procurement cost per annum?					
How much was the total Planning costs					
How much was the industry average planning cost per annum?					
How much was the total coordination costs?					
How much was the industry average coordination cost per annum?					
How much was the total monitoring costs?					
How much was the industry average total monitoring cost per annum?					
How much was the total inventory management costs					
How much was the industry average					

inventory management cost per annum?					
How much was the total communication costs?					
How much was the industry average total communication cost per annum?					

7 (d). From your customer feedback, suggestions, compliments and complaints, what is rating of your products in terms of the following quality dimensions

Dimension	**2010**	**2011**	**2012**	**2014**	**2014**
How many final finished products were sold to customers during the year?					
How many customers expressed their dissatisfaction with your products performance?					
How many customers expressed their dissatisfaction with extra product features included in your finished products beyond those primary to the functionality of the product?					
How many customers expressed their dissatisfaction with your products Reliability?					
How many complaints were received with respect to product's failure to meet customer expectations					
How many complaints were received in respect to unexpectedly short product life cycles?					

END OF QUESTIONNAIRE. THANK YOU.

Appendix 3: List of Manufacturing Firms

	Firm Name	Industry
1.	Hy-Q Enterprises Ltd	Processing and preserving of meat
2.	Season Kenchir	Processing and preserving of meat
3.	Lyntano	Processing and preserving of meat
4.	Alpha Line Foods	Processing and preserving of meat
5.	Samaki 2000 Limited	Processing and preserving of fish
6.	East Africa Sea Food Ltd	Processing and preserving of fish
7.	W.E Tilley (M) Limited	Processing and preserving of fish
8.	Prinsal Enterprises Ltd	Processing and preserving of fish
9.	Juicee Juice It Up Ltd	Processing of fruit and vegetables
10.	EA Chappanina	Processing of fruit and vegetables
11.	Cofresh Confectioners	Processing of fruit and vegetables
12.	Macuisine	Processing of fruit and vegetables
13.	Energy Food Ltd	Processing of fruit and vegetables
14.	Imenti Farmfresh Ltd	Processing of fruit and vegetables
15.	Primavara Picknick Snacks	Processing of fruit and vegetables
16.	Frigoken Limited	Processing of fruit and vegetables
17.	White Dezert Limited	Manufacture of oils and fats
18.	Towrit Oil Limited	Manufacture of oils and fats
19.	Vector International Limited	Manufacture of oils and fats
20.	Banoda Oil Limited	Manufacture of oils and fats
21.	Primier Oil Mills Ltd	Manufacture of oils and fats
22.	Premier Oil Mills Ltd	Manufacture of oils and fats
23.	Erthoil Kenya Pty Epz Ltd	Manufacture of oils and fats
24.	Kapa Oil Refineries Limited	Manufacture of oils and fats
25.	Innovative Ingredients Solutions Ltd.	Manufacture of dairy products
26.	White Dezert Ltd	Manufacture of dairy products
27.	Uzuri Manufactures Ltd	Manufacture of dairy products
28.	New Kenya Cooperative Creameries	Manufacture of dairy products
29.	Bio Food Products Ltd	Manufacture of dairy products
30.	Glacier Product Limited	Manufacture of dairy products
31.	Sameer Agricultural And Livestock(K) Limited	Manufacture of dairy products
32.	Mombasa Maize Millers Ltd	Manufacture of grain mill products
33.	Nzuri Foods Limited	Manufacture of grain mill products
34.	Raen Posho Mill	Manufacture of grain mill products
35.	Kifaru Grain Millers	Manufacture of grain mill products

36.	Solai Flour Mills	Manufacture of grain mill products
37.	The Breakfast Cereal Company Limited	Manufacture of grain mill products
38.	Muharata Food Company Limited	Manufacture of grain mill products
39.	Belt Poshomill	Manufacture of grain mill products
40.	Faj Safe Way Foods	Manufacture of grain mill products
41.	Gitembura Millers Limited	Manufacture of grain mill products
42.	Wheatbee Ltd	Manufacture of starches
43.	Shri Ganesha Manufacturers Limited	Manufacture of starches
44.	Duluexe Food Industry	Manufacture of starches
45.	Norda Industries Ltd	Manufacture of starches
46.	Supa Snacks	Manufacture of starches
47.	Ticktack	Manufacture of bakery products
48.	Avon Industries Ltd	Manufacture of bakery products
49.	Hometown Bakery Lrd	Manufacture of bakery products
50.	Chapban Bhog Ltd	Manufacture of bakery products
51.	Hometown Bakers Limited	Manufacture of bakery products
52.	Kenafric Bakery Limited	Manufacture of bakery products
53.	Bakers Gardens	Manufacture of bakery products
54.	Alexandre Chocolating Ltd	Manufacture of bakery products
55.	Gold Wheat Bakers	Manufacture of bakery products
56.	The Windmill Limited	Manufacture of bakery products
57.	Rose Gardens Confectioners	Manufacture of bakery products
58.	Well Bache Products	Manufacture of bakery products
59.	Linset Industries Ltd	Manufacture of bakery products
60.	Hongs Bakery Restaurant	Manufacture of bakery products
61.	Abantu Company	Manufacture of bakery products
62.	Kenya Sweets Ltd	Manufacture of confectionery
63.	Thakker Sweets	Manufacture of confectionery
64.	Jambo Biscuits (K) Limited	Manufacture of confectionery
65.	Sweety Sweets Ltd	Manufacture of confectionery
66.	Patco Industries Ltd	Manufacture of confectionery
67.	Pearl Industries	Manufacture of confectionery
68.	Al Yusra	Manufacture of other food products
69.	Rlpis Industries Ltd	Manufacture of other food products
70.	Dormans Coffee Ltd	Manufacture of other food products
71.	Re-Suns Spices Limited	Manufacture of other food products
72.	Al-Mahra Industries Ltd	Manufacture of other food products
73.	Propack Kenya Limited	Manufacture of other food products

74.	Supacosm Products Limited	Manufacture of other food products
75.	Nature's Health Ltd	Manufacture of other food products
76.	Chirag (Kenya) Ltd	Manufacture of other food products
77.	Melyin Marsh Ltd	Manufacture of other food products
78.	Gakima Coffee Factory	Manufacture of other food products
79.	Deepa Industries Ltd	Manufacture of other food products.
80.	Maridadi Harvest Ltd	Manufacture of animal feeds
81.	By Grace Farm Feed Ltd	Manufacture of animal feeds
82.	Merchant Manufacturers	Manufacture of animal feeds
83.	Carevet Systems Limited	Manufacture of animal feeds
84.	Dajan Millers	Manufacture of animal feeds
85.	Kengrow Limited	Manufacture of animal feeds
86.	Stanpur K Limited	Manufacture of animal feeds
87.	Wann Feeds	Manufacture of animal feeds
88.	Global Environmental Solutions Ltd	Manufacture of animal feeds
89.	Africa Spirits Limited	Distilling of spirits
90.	Cryway Enterprises Limited	Distilling of spirits
91.	Ozzbeco Kenya Limited	Distilling of spirits
92.	Erdemann Epz Limited	Distilling of spirits
93.	Patiala Distillers (K) Ltd	Distilling of spirits
94.	Real Beverages Epz Ltd	Distilling of spirits
95.	Vineyard Holdings Limited	Manufacture of wines
96.	The Comrade Investment	Manufacture of wines
97.	Vinepack Limited	Manufacture of malt liquors and malt
98.	Ozzbeco K Ltd	Manufacture of malt liquors and malt
99.	East Africa Malting Ltd	Manufacture of malt liquors and malt
100.	Kenya Breweries Ltd	Manufacture of malt liquors and malt
101.	Juice Paradise	Manufacture of soft drinks
102.	Kathini Spring Mineral Water Limited	Manufacture of soft drinks
103.	Ramji Haribhai Devani Ltd	Manufacture of soft drinks
104.	House Of Aloe Limited	Manufacture of soft drinks
105.	Afia Commodities (Kenya) Limited	Manufacture of soft drinks
106.	Wotafina Springs	Manufacture of soft drinks
107.	Wandomist Supplies	Manufacture of soft drinks
108.	Aviano Eastafrica Limited	Manufacture of soft drinks
109.	Josra Coffee Company Limited	Manufacture of soft drinks
110.	Giant Capital Technologies	Manufacture of soft drinks

111.	Mastermind Tobacco (K) Limited	Manufacture of tobacco products
112.	UDV (Kenya) Limited	Manufacture of tobacco products
113.	West House Tobacco K Ltd	Manufacture of tobacco products
114.	British American Tobacco (K) Ltd	Manufacture of tobacco products
115.	Wildlife Works (Epz) Limited	Preparation of textile fibres
116.	Teita Estate Limited	Preparation of textile fibres
117.	Ultra Ltd	Preparation of textile fibres
118.	African Cotton Industries Ltd	Preparation of textile fibres
119.	The Spinners Ltd	Preparation of textile fibres
120.	Migotiyo Plantation Ltd	Preparation of textile fibres
121.	Dwa Estate Limited	Preparation of textile fibres
122.	Trio Craft Rugs Ltd	Weaving of textiles
123.	Dimple Tailorig And Boutique	Weaving of textiles
124.	Interweave Craft	Weaving of textiles
125.	Kaajal Textiles Limited	Weaving of textiles
126.	Oriental Mills Ltd	Weaving of textiles
127.	TSS Spinning And Weavind Ltd	Weaving of textiles
128.	Premier Industries Ltd	Weaving of textiles
129.	Noor Relief Services Ltd	Manufacture of made-up textile articles
130.	Mosman Enterprises	Manufacture of made-up textile articles
131.	Oasis Tents & Shades	Manufacture of made-up textile articles
132.	Kema Tents Enterprises	Manufacture of made-up textile articles
133.	Azad Automobile Trymmings Ltd	Manufacture of made-up textile articles
134.	Executive Curtains And Furniture Ltd	Manufacture of made-up textile articles
135.	Wananchi Clothing Factory(K) Ltd	Manufacture of made-up textile articles
136.	Classsic Uniform Makers Ltd	Manufacture of made-up textile articles
137.	Edges&Metals Services	Manufacture of made-up textile articles
138.	Crown Tent	Manufacture of made-up textile articles
139.	Kamba Manufacturing	Manufacture of cordage and rope
140.	Kawa Garments Ltd	Manufacture of other textiles
141.	Gopitesh (K) Ltd	Manufacture of other textiles
142.	Distinct Garment Factory	Manufacture of other textiles
143.	Prodex E.A Ltd	Manufacture of other textiles
144.	Nishit And Co Ltd	Manufacture of other textiles

145.	Crown Clothing K Ltd	Manufacture of other textiles
146.	Absolutely Fabulous Menswear Company Limited	Manufacture of articles of fur
147.	Bestfoam Company Limited	Manufacture of articles of fur
148.	Ajit Clothing Factory Limited	Manufacture of articles of fur
149.	Syle Buy Traders	Manufacture of knitted apparel
150.	Nairobi Drapers Kenya Limited	Manufacture of knitted apparel
151.	Abdulwadood Tanners Limited	Tanning and dressing of leather
152.	Goldrock International Enterprises Co. (K) Ltd	Tanning and dressing of leather
153.	Zungo Investments Ltd	Tanning and dressing of leather
154.	Faaso Exporters Limited	Tanning and dressing of leather
155.	Kana Garments Ltd	Manufacture of wearing apparel
156.	Josper Ltd	Manufacture of wearing apparel
157.	Dynamic Drapers Limited	Manufacture of wearing apparel
158.	Tinga Ntina Lifestly Limited	Manufacture of wearing apparel
159.	Hans Apparel Ltd	Manufacture of wearing apparel
160.	Straight Line Enterprises Limited	Manufacture of wearing apparel
161.	Brother Shirts Factory Ltd	Manufacture of wearing apparel
162.	Crown Clothing(K)Ltd	Manufacture of wearing apparel
163.	Lo-Stud Ltd	Manufacture of wearing apparel
164.	East African Tanners K Ltd	Tanning and dressing of leather
165.	Leather Masters Limited	Manufacture of luggage and handbags
166.	Sandstorm Africa Ltd	Manufacture of luggage and handbags
167.	Ark Tents & Leather Ltd	Manufacture of luggage and handbags
168.	Donglang Compant Ltd	Manufacture of luggage and handbags
169.	Sandstorm (Africa) Limited	Manufacture of luggage and handbags
170.	Weagals E.A Limited	Manufacture of footwear
171.	Best Choice Shoes	Manufacture of footwear
172.	Italshoe(K)Limited	Manufacture of footwear
173.	Kenya Suitcase Manufacturers Ltd	Manufacture of footwear
174.	Topen Industries Ltd	Manufacture of footwear
175.	C And P Shoe Industries Limited	Manufacture of footwear
176.	Kenafric Industries Ltd	Manufacture of footwear

177.	Exotic Wood Products Limited	Sawmilling and planing of wood
178.	Woodquip Industries Ltd	Sawmilling and planing of wood
179.	Gopi Furniure & Joinery Ltd	Sawmilling and planing of wood
180.	Wood Manufacturers Ltd	Sawmilling and planing of wood
181.	Tim Joint Ltd	Sawmilling and planing of wood
182.	Rosewood Furniture Manufacturers Ltd	Manufacture of builders' carpentry and joinery
183.	Tumac Alluminium &Interiors Limited	Manufacture of builders' carpentry and joinery
184.	Woodcharm	Manufacture of builders' carpentry and joinery
185.	Ghanshiam Wood Ent.Ltd	Manufacture of builders' carpentry and joinery
186.	Jaswood Works	Manufacture of builders' carpentry and joinery
187.	The Friendship Company	Manufacture of wooden containers
188.	Dodhice Packaging Ltd	Manufacture of wooden containers
189.	Afro Kent Office Equipments	Manufacture of other products of wood
190.	Wedgewood Kenya Ltd	Manufacture of other products of wood
191.	Jubilee Woodsales Ltd	Manufacture of other products of wood
192.	Pentagon Interior Ltd	Manufacture of other products of wood
193.	Mobilcasa	Manufacture of other products of wood
194.	Tissue Kenya Limited	Manufacture of pulp, paper and paperboard
195.	International Paper And Board Supllies Limited	Manufacture of pulp, paper and paperboard
196.	Penta Converters Ltd	Manufacture of pulp, paper and paperboard
197.	Karsam Services Co Ltd	Manufacture of pulp, paper and paperboard
198.	The Paper House Of Kenya Limited	Manufacture of pulp, paper and paperboard
199.	Karsam Serviettes Co Ltd	Manufacture of pulp, paper and paperboard
200.	Tetra Pak	Manufacture of corrugated paper
201.	Carton Manufucturers Ltd	Manufacture of corrugated paper
202.	Silpack Industries Ltd	Manufacture of corrugated paper
203.	Dodhia Packaging Limited	Manufacture of corrugated paper
204.	Press Master Ltd	Manufacture of corrugated paper
205.	D.L Patel Press Kenya Limited	Manufacture of other articles of paper
206.	Rainbow Manufacturing Ltd	Manufacture of other articles of paper
207.	Express Systems Company Limited	Manufacture of other articles of paper

208.	Top Rank Suppliers	Manufacture of other articles of paper
209.	Modern Oil Processors Limited	Manufacture of refined petroleum products
210.	Lean Energy Solutions Ltd	Manufacture of refined petroleum products
211.	Ocenn Lubricants Ltd	Manufacture of refined petroleum products
212.	Jakharia Packers	Manufacture of refined petroleum products
213.	Bio Medica Laboratories Limited	Manufacture of basic chemicals
214.	Welding Alloys Ltd	Manufacture of basic chemicals
215.	Kel Chemicals Ltd	Manufacture of basic chemicals
216.	Boc Kenya Limited	Manufacture of basic chemicals
217.	K.T.D.A	Manufacture of fertilizers
218.	Dera Chemical Industries (K) Ltd	Manufacture of fertilizers
219.	Osho Chemical Industries Limited	Manufacture of fertilizers
220.	Africa Polysack Limited	Manufacture of plastics and synthetic rubber.
221.	Naivasha Plastics Limited	Manufacture of plastics and synthetic rubber
222.	Complact Industries Ltd	Manufacture of plastics and synthetic rubber
223.	Plastico Industries	Manufacture of plastics and synthetic rubber
224.	General Printers Limited	Manufacture of plastics and synthetic rubber
225.	Maroo Polymers Ltd	Manufacture of pesticides
226.	Cosmos	Manufacture of pesticides
227.	Ultravetis	Manufacture of pesticides
228.	Nova Industries Ltd	Manufacture of pesticides
229.	Dera Chemical Industries K.Ltd	Manufacture of pesticides
230.	Twiga Chemicals Industries Ltd	Manufacture of pesticides
231.	Kenya Inks And Coating Industries Limited	Manufacture of paints
232.	Lunar Paints	Manufacture of paints
233.	Deco Paints Limited	Manufacture of paints
234.	Kenind Products(K) Limited	Manufacture of paints
235.	Seweco Industrial Coatings Company Limited	Manufacture of paints
236.	Sunchem Enterprises	Manufacture of paints
237.	Taiga Paints	Manufacture of paints

238.	Prime Coatings Ltd	Manufacture of paints
239.	Sheer Magic Cosmetics	Manufacture of soap
240.	Halide Chemical Industries	Manufacture of soap
241.	Terminix Sevices	Manufacture of soap
242.	Sureclean Products Ltd	Manufacture of soap
243.	Diarim Enterprises Ltd	Manufacture of soap
244.	Thika Wax Works Ltd	Manufacture of soap
245.	Ecolab East Africa(Kenya)Limited	Manufacture of soap
246.	Orion E.A Ltd	Manufacture of chemical products
247.	Tiger Brands (K) Limited	Manufacture of chemical products
248.	Teckote Enterprises	Manufacture of chemical products
249.	Afro European Cosmetics Company Limited	Manufacture of chemical products
250.	Ball Chemicals	Manufacture of chemical products
251.	Leons Chemicals	Manufacture of chemical products
252.	Continental Products Liited	Manufacture of chemical products
253.	Continental Products Ltd	Manufacture of chemical products
254.	Dunlod Industries	Manufacture of chemical products
255.	Infusion Medicare Limited	Manufacture of pharmaceuticals
256.	Sigma Laboratories	Manufacture of pharmaceuticals
257.	Assia Pharmaceuticals	Manufacture of pharmaceuticals
258.	Behea Pharmacy Ltd	Manufacture of pharmaceuticals
259.	Two Families Limited	Manufacture of pharmaceuticals
260.	Vestergaard Frandsen (E.A) Limited	Manufacture of pharmaceuticals
261.	Kitengela Hot Glass Limited	Manufacture of glass
262.	School Equipment Production Unit	Manufacture of glass
263.	Sai Raj	Manufacture of glass
264.	Glass Manufacturing	Manufacture of glass
265.	Specialised Fibre Glass Ltd	Manufacture of glass
266.	Super Manufacturers Limited	Manufacture of glass
267.	Saj Ceramics Limited	Manufacture of refractory products
268.	Mareba Enterprises Limited	Manufacture of clay building materials
269.	Clayworks Ltd	Manufacture of clay building materials
270.	Kenya Clay Products Ltd	Manufacture of clay building materials
271.	Pottery Africa	Manufacture of other porcelain
272.	Clay Artisan S.H.G	Manufacture of other porcelain
273.	Sterling Craft Kenya Ltd	Manufacture of other porcelain
274.	Tile City Limited	Manufacture of other porcelain

275.	Kip Melamine Co. Ltd	Manufacture of other porcelain
276.	Bamburi Cement Limited	Manufacture of cement and plaster
277.	Mombasa Cement Limited	Manufacture of cement and plaster
278.	Mombasa Cement Ltd	Manufacture of cement and plaster
279.	Cabroworks (Ea) Ltd	Manufacture of articles of concrete
280.	Maruba Enterprise Limited	Manufacture of articles of concrete
281.	Eagle Tiles	Manufacture of articles of concrete
282.	Bilco Ingineering	Manufacture of articles of concrete
283.	National Concrete Ltd	Manufacture of articles of concrete
284.	Steelplus Limited	Manufacture of basic iron and steel
285.	Turn O Metal Eng Ltd	Manufacture of basic iron and steel
286.	Alliance Steel Works	Manufacture of basic iron and steel
287.	Welding Alloys	Manufacture of basic iron and steel
288.	Asl Ltd-Trading Division	Manufacture of basic iron and steel
289.	Tononoka Steels Limited	Manufacture of basic iron and steel
290.	New World Stainless Limited	Casting of iron and steel
291.	Kinetics Eng Ltd	Casting of iron and steel
292.	Pelican Signs Ltd	Casting of non-ferrous metals
293.	Wrought Iron Design	Manufacture of structural metal
294.	Magnum Engineering And General Contractors Ltd	Manufacture of structural metal
295.	High Hope Steel Fabrics & Woodwork	Manufacture of structural metal
296.	Span Structures Limited	Manufacture of structural metal
297.	Dynamics General & Ind.(K)Ltd	Manufacture of structural metal
298.	Span Fabricators Limited	Manufacture of tanks
299.	Zedco Radiators&Cooling Systems Ltd	Manufacture of tanks
300.	Kenya Yuncheng Plate Making Ltd	Manufacture of tanks
301.	Habi Singh Co Ltd	Manufacture of tanks
302.	PCTL Automation Limited	Manufacture of electronic components
303.	Switch Gear & Controls Ltd	Manufacture of electronic components
304.	Infocard Africa Ltd	Manufacture of computers
305.	Zumtd Communication Ltd	Manufacture of consumer electronics
306.	Davids Scales and Equipments	Manufacture of measuring equipment
307.	T and D group ltd	Manufacture of measuring equipment
308.	Power Technics Ltd	Manufacture of electric generators
309.	Metsec Cables Limited	Manufacture of electric wires

310.	Afro Cables Industries Limited	Manufacture of electric wires
311.	Kenwest Cables Ltd	Manufacture of electric wires
312.	East Africa Cable Ltd	Manufacture of electric wires
313.	Kenshades Limited	Manufacture of lighting equipment
314.	Craftskills Ea Limited	Manufacture of lighting equipment
315.	Power Protection Ltd	Manufacture of lighting equipment
316.	Nationwide Elecrticals Industries Ltd	Manufacture of lighting equipment
317.	Unighir Ltd	Manufacture of domestic appliances
318.	Sen Tech Limited	Manufacture of electrical equipment
319.	Pelican Signs Limited	Manufacture of electrical equipment
320.	Nanak Crankshaft Grinders Ltd	Manufacture of bearing and gearing
321.	Jostechno East And Central Africa Limited	Manufacture of ovens and furnaces
322.	Italproduct Ltd	Manufacture of ovens and furnaces
323.	Victo Hydrotech And Radiator Services	Manufacture of hand tools
324.	Pipe Manufacturers Ltd	Manufacture of general machinery
325.	Marshall Fowler (Eng) Ltd	Manufacture of general machinery
326.	Timwood Product Ltd	Manufacture of general machinery
327.	Marshall-Fowler Engineers Limited	Manufacture of forestry machinery
328.	J.F Mccloy Ltd	Manufacture of forestry machinery
329.	Associated Casket Manufacturers Ltd	Manufacture of forming machinery
330.	Kaluworks Limited	Manufacture of forming machinery
331.	Gahir Engineering Works Ltd	Manufacture of machinery for mining
332.	Makiga Engineering Services Ltd	Manufacture of machinery for mining
333.	Balwart Didar Engineers Ltd	Manufacture of machinery for food
334.	D.K.Engeneering Co.Ltd	Manufacture of machinery for food
335.	Lembus Traders	Manufacture of machinery for textile
336.	Troika Limited	Manufacture of special machinery
337.	Kickstart International	Manufacture of special machinery
338.	Highland Tourist Industrial Garage Limited	Manufacture of motor vehicles
339.	Laah Singh Harnam Singh Ltd	Manufacture of motor vehicles
340.	Numerical Machining Complex Ltd	Manufacture of motor vehicles
341.	General Motors East Africa Ltd	Manufacture of motor vehicles
342.	General Motors East Africa	Manufacture of motor vehicles
343.	Banbros Ltd	Manufacture of motor vehicles bodies

344.	Bhachu Engineers Limited	Manufacture of motor vehicles bodies
345.	Sembi Body Buliders	Manufacture of motor vehicles bodies
346.	Admart Africa Limited	Manufacture of motor vehicles bodies
347.	Axel Engineering And Manufacturing Limited	Manufacture of motor vehicles bodies
348.	Charger Engineers Limited	Manufacture of parts for motor vehicles
349.	Setlak 2000	Manufacture of parts for motor vehicles
350.	Setlak2000 Motorcycles	Manufacture of parts for motor vehicles
351.	Nasa Products Ltd	Manufacture of parts for motor vehicles
352.	Hill Products Kenya Ltd	Manufacture of parts for motor vehicles
353.	Trichamp Industries K Limited	Manufacture of parts for motor vehicles
354.	Associate Basket Manufacturers	Manufacture of parts for motor vehicles
355.	Silent Flow Exhaust Manufacturers Limited	Manufacture of parts for motor vehicles
356.	Good Will Furnitures	Manufacture of furniture
357.	Jats Furnitures	Manufacture of furniture
358.	Reflection Furniture Ltd	Manufacture of furniture

Source: KNBS (2013)

Appendix 4: Multicollinearity Test Results

Table 4. 74: Multicollinearity for Primary Processes

Model		Collinearity Statistics	
		Tolerance	VIF
1	Steering processes	.987	1.013
	Communication processes	.952	1.050
	Decision processes	.962	1.040
	Secondary processes	.990	1.010

a. Dependent Variable: Primary processes

Table 4. 75: Multicollinearity for Secondary Supply Chain Processes

Model		Collinearity Statistics	
		Tolerance	VIF
1	Primary processes	.933	1.072
	Steering processes	.929	1.076
	Decision processes	.958	1.044
	Communication processes	.957	1.045

a. Dependent Variable: Secondary processes

Table 4. 76: Multicollinearity for Steering Supply Chain Processes

Model		Collinearity Statistics	
		Tolerance	VIF
1	Primary processes	.763	1.310
	Decision processes	.964	1.037
	Communication processes	.956	1.046
	Secondary processes	.763	1.311

a. Dependent Variable: Steering processes

Table 4. 77: Multicollinearity for Decision Supply Chain Processes

Model		Collinearity Statistics	
		Tolerance	VIF
1	Communication processes	.983	1.018
	Secondary processes	.750	1.334
	Primary processes	.710	1.409
	Steering processes	.920	1.087

a. Dependent Variable: Decision processes

Table 4. 78: Multicollinearity for Communication Supply Chain Processes

Model		Collinearity Statistics	
		Tolerance	VIF
1	Secondary processes	.754	1.326
	Primary processes	.707	1.414
	Steering processes	.918	1.089
	Decision processes	.989	1.011

a. Dependent Variable: Communication processes