SUPPLY CHAIN MANAGEMENT PRACTICES AND PERFORMANCE IN CEMENT INDUSTRY IN KENYA

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DECLARATION

This management research project is my original work and has not been submitted for examination in any other University.

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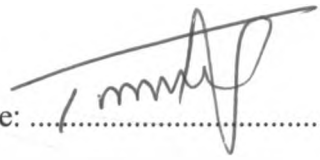
This management research project has been submitted for examination with my approval as a university supervisor.

Signature:  Date: 7/11/2011

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Finally, I owe my gratitude to a number of people who in one way or another contributed towards completion of this project especially my fellow colleagues at work and students. To all of you, I say *Asante Sana*!

DEDICATION

To my family

ABSTRACT

With the number of players increasing in the cement industry, competition has been heightened thus there is need for the firms in the cement industry to devise ways to enable them stay competitive. One of this ways is to reduce on the supply chain costs my effectively managing their supply chains. This study sought to answer the following question: what are the supply chain management practices in the cement industry in Kenya? What impact does SCM practices have on financial performance?

This study adopted a survey design. The population was all the 5 cement firms in Kenya. A sample of 25 respondents drawn from the procurement departments of the cement companies was used. Primary data were collected in this study using questionnaires. The survey questionnaire was administered using a combination of methods including drop-and-pick later methods, self-administration, and e-mails. SPSS was used to perform descriptive, correlation and regression analysis.

The study found that the most common supply chain management practices in the cement industry were: common set of operating policies, written contracts, clear guidelines and procedures for creating alliances, and supplier screening among other practices. The correlation and regression results showed that supply chain management had a positive and significant influence on performance at 5% level. The study concludes that supply chain management lead to better performance of companies. It is recommended that the management of cement firms in Kenya should keep up establishing ways to manage their supply chains better as this has a direct influence on performance.

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CHAPTER ONE: INTRODUCTION

1.1 Background of the study

1.1.1 Supply Chain Management

New realms of technology and globalization have created a plethora of business opportunities and challenges to be tapped and mastered. Effective supply chains provide opportunities to create a sustainable competitive advantage (Tracey, Lim, & Vonderembse, 2005).The idea of supply chain management is to evaluate the processes of planning, implementing, and controlling the movement of materials and finished goods all the way into the end-users. The interconnected activities of supply chain begin with a customer order, and complete when the goods are in the customer's hand. To have those goods delivered to end-users; it requires a network of contributions from parties involved; retailers, wholesalers, distributors, manufacturers, and raw materials suppliers (Waskita, 2007). Chopra and Meindl (2001) conclude that the objective of supply chain is to maximize the overall value on each of the chain. This concurs with what Siem (2005) has stated, SCM strives to get the right things to the right places at the right times for maximum profits.

The focus of SCM appears to be maximizing the chain's profitability. One presumption states that as interactions between parties improve, it is expected that outcomes accelerate. Perhaps, this is true in turns of better inventory turnovers, on-time delivery, responsiveness, quality, price reduction, efficiency and effectiveness in bringing the finished goods into the customers' hands. Noting the true gains and potential losses of such interactions among parties involved are an important issue in supply chain management, nonetheless. The core of SCM focuses on production, inventory,

distribution, and payment cycles. As a result, the existence of information technologies, and thus, the actual information sharing among parties involved are crucial (Anantadjaya and Nawangwulan, 2006; Siem, 2005).

The traditional view of supply chain management is to leverage the supply chain to achieve the lowest initial purchase prices while assuring supply. Typical characteristics include: multiple partners; partner evaluations based on purchase price; cost-based information bases; arm's-length negotiations; formal short-term contracts; and centralized purchasing. Operating under these conditions encourages fierce competition among suppliers, often requiring playing one supplier against the others, and uses rewards or punishment based on performance. The fundamental assumption in this environment is that trading partners are interchangeable and that they will take advantage if they become too important. In addition, there is a belief that maximum competition, under the discipline of a free market, promotes a healthy and vigorous supply base which is predicated on the "survival of the fittest" (Siem, 2005).

Under the new paradigm, supply chain management is redefined as a process for designing, developing, optimizing, and managing the internal and external components of the supply system, including material supply, transforming materials and distributing finished products or services to customers, that is consistent with overall objectives and strategies. Analytically, a supply chain is simply a network of material processing cells with the following characteristics: supply, transformation, and demand (Davis, 1993).

Quayle (2003) identified 18 different SCM practices such as supplier development, e-commerce, new technology, time-to-market, staff development, leadership, strategy, team working, and waste reduction that are essential to improve the competitive position of a company. Tan (1999) considered more SCM practices such as collaboration, trust, ethical practices, continuous improvement efforts, and infrastructure drivers. This list of SCM practices is more comprehensive than the list used by Quayle (2003). These practices will be tested in the cement industry in Kenya in the present study.

1.1.2 Cement Industry in Kenya

There has been a lot of development in Kenya in the recent past in terms of infrastructure. Roads are being built and the real estate sector is also booming. This has called for the cement manufacturers to streamline their operations in order to be efficient as the infrastructural developments depend so much on the cement industry hence the need for better supply chain management (SCM).

According to the Central Bank of Kenya's latest Monthly Economic Survey for February 2011, cement production in the country has been rising. The statistics show that there was an output of 3,320,282 metric tonnes of cement in 2009 representing an output growth of 17.4% from the previous period while in 2010 the output was 3,709,807 representing an output growth of 11.7% from the previous year. This output growth represents the growth in cement demand in the country and in the region (Central Bank of Kenya, 2011).

Bamburi is the regional market leader in East Africa with an estimated control of 31% of the market (Business Daily, 2011). Other players in the cement industry are the East

African Portland Cement (EAPCC) and Athi River Mining (ARM). East African Portland Cement (EAPCC) is the second largest cement producer with total installed capacity of 1.4 metric tonnes annually after a new plant producing 0.7 metric tonnes was commissioned in 2010. It accounts for 29 per cent of Kenya's installed cement capacity (Business Daily, 2011). Athi River Mining (ARM), the third largest producer in Kenya (Business Daily, 2011). ARM grew its revenues 28 per cent to Sh3.69 billion in the half, attributing the growth to a double digit increase from its cement business, which accounts for about 53 per cent of the turnover (Gachiri, 2011).

Another player in the industry is Devki Steel Mills Ltd's National Cement (trading as Simba Cement) which has a daily capacity of 2,000 metric tonnes. Other new entrants include Mombasa Cement, and Cemtech Sanghi, who are challenging the dominance of players - Bamburi Cement, East African Portland Cement Company, and Athi River Mining (Cementchina, 2010). The entry of new players in the market has resulted in price wars (Njiraini, 2011). Due to the high production and distribution costs, import of cheap cement has brought fresh challenge to local cement producers (Business Daily, 2011). This has eroded the profitability of major players in the industry and hence reduced their market share.

Cement industry is considered as one of the most energy intensive manufacturing industries around the globe as it is the basic component of making concrete, making this industry with a priority of having a clear understanding, and careful planning and control of its manufacturing and managerial activities and operations (Hokoma et al., 2008).

Some of the supply chain management practices in the industry include use of economic order quantity systems, the use of agents and distributors, and the application of management systems (El-Dubei and Hokoma, 2011).

1.2 Statement of the Problem

In a bid to cope with market instability, companies now look beyond cost advantage. Speed, quality and flexibility are being emphasized as means of responding to the unique needs of customers and markets. Supply chain management focuses on efficiency. Businesses are witnessing a transformation in which suppliers and customers are inextricably linked throughout the entire sequence of events that bring raw material from its source of supply, through different value adding activities to the ultimate customer. Success is no longer measured by a single transaction; competition is, in many instances, evaluated as a network of co-operating companies competing with other firms along the entire supply chain (Spekman et al., 1994). Barve (2010) linked the agility in supply chains to customer satisfaction (Barve, 2010). Recently, Kumar et al. (2011) developed a longitudinal study that built upon previous findings that operations performance of service delivery can positively affect customer satisfaction. This service delivery is possible with better managed supply chain.

The cement industry plays a major role in the economy of Kenya in terms of employment creation and total contribution to Gross Domestic Product (GDP). With the number of players increasing in the industry, competition has been heightened. This calls for the firms in the cement industry to devise ways to enable them stay competitive. One of this

ways is to reduce on the supply chain costs my effectively managing their supply chains. Some of the SCM practices in this industry include the use of distributors or authorised agents to distribute their products. This and other practices in the industry could be useful in cutting down the costs and enhancing operational efficiency. It would be however important to document what specific SCM practices are used in the cement industry. This is what the present study sought to do.

A number of studies have been done on supply chain management in Kenya. For instance, Mukasa (2010) studied the impact of supply chain management practices on the performance of Safaricom; Ijomba (2010) studied the effects of integrated supply chain on the performance of Nairobi Bottlers Ltd; Mageto (2009) studied the relationship between supply chain performance and supply chain responsiveness of supermarkets in Kenya; Gwako (2008) studied supply chain performance measurement in Kenya Airways; while Ngari (2008) studied supply chain management practices at the University of Nairobi. As can be seen, these studies, it is evident that there is no known study that has focused on addressing this gap. This study therefore sought to answer the following question: what are the supply chain management practices in the cement industry in Kenya? What impact does SCM practices have on financial performance?

1.3 Objective of the Study

The objectives of this study were:

i. To establish the supply chain management practices in the cement industry in Kenya.

ii. To determine the impact of supply chain management practices on firm performance.

1.4 Importance of the Study

This study adds onto the body knowledge of supply chain management by focusing on the development of the practice in a developing country. Further, it adds onto the knowledge on the impact of supply chain management practices in the cement industry.

The cement companies in Kenya will benefit from the study because the documentation of how the practice of supply chain is carried out in the companies, the critique of the practice and the documentation of the challenges will offer an impetus to the companies to devise better ways of practicing the same. The recommendations given will guide them in strengthening the practice in such organisations.

Firms in other industries will also find this study useful as the results will show how the practice of supply chain management in carried out in the cement industry and what practices they can borrow from the same.

Students, researchers, scholars, consultants, and other practitioners will find this study a useful guide for purposes of learning, discussions, consulting, and future research in the area.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature on supply chain management. The chapter is organised as follows. First, a theoretical literature on the theories that explain the motivation for supply chain management in organisations is presented. Then, an empirical review of prior studies done on supply chain management is made. Finally, a summary of the literature summarises the chapter and provides the research gap is the present study seeks to bridge.

2.2 Theoretical Literature

Several theories have been used by various scholars in their studies in supply chain management. These theories include resource-based theory, knowledge based theory, strategic choice theory, agency theory, institutional theory, and systems theory, the game theory among others. Some of these theories, more so transaction cost theory, resource-based view, strategic choice theory, and agency theory are presented in this study because they are relevant to the objective of the study. They explain the motivation for instituting SCM practices in the cement industry in Kenya.

2.2.1 Transaction Cost Theory

The early studies of transaction cost theory as described in the works of Coase (1937) and others had paid little attention to the internal operation of the organization (Pitelis and Wahl 1998, as cited in Foss 1999). Williamson (1975, 1981) further expanded the application of transaction cost theory by highlighting the role of transaction cost theory in promoting vertical integration and trust in organizations. These aspects of transaction cost

theory are supporting evidences for the role of supply chain management in organizations. This theory is relevant in the study of SCM in the cement industry in Kenya as it explains that the firms in the cement industry can reduce the transaction costs associated with the distribution of products and sourcing of raw materials. Firms that have lower transactions costs are therefore able to perform better in terms of their SCM.

Grover and Malhotra (2003) in their well-cited study conduct an extensive investigation on the application of transaction cost theory in supply chain management. In their empirical study of 1000 purchasing managers, Grover and Malhotra (2003) conclude that transaction cost theory applies to organizational supply chain management in four facets: effort, monitor, problem, and advantage. The theory applies to the effort to build and maintain the relationship with suppliers; cost of monitoring the performance of suppliers; resolving the problems that arises in the business relationships; and engagement of suppliers in an opportunistic behavior. However, transaction cost theory is primarily concerned with the direct economic factors in organizations and hence fails to address some important aspects of the operation of organizational supply chain, including personal and human relations among actors in the supply chain.

2.2.2 Resource-based View

Resource-based theory has adequately explained the development of core competencies that can be used to design better supply chain practices (Barney, 1991; Hamel & Prahalad, 1994; Lim, Sharkey, & Heinrichs, 2006). These practices, in turn, improve the competitive position of a firm. The RBV focuses on how strategic resources provide

organizations with competitive advantages and superior performance (Barney, 1991). Resource-based view is another organizational theory that similar to transaction cost theory, is mostly concerned with the economic aspect of operations in organizations. This theory is relevant for studying firms in the cement industry as it provides more insight into understanding of value systems in the firms as it emphasizes the importance of knowledge as a production factor in organizations. Companies endowed with better factors of production and competences will perform better in terms of the SCM.

More attention has been paid to the application of resource-based view in organizational supply chain management during the past decade. Morash and Lynch (2002) employed resource based view in their study of global supply chain capability and performance. In another study Wu, Yeniyurt, Kim and Cavusgil (2005) illustrated the application of resource-base view in the impact of IT on organizational supply chain capabilities and performance. Gold, Seuring, and Beske (2009) extended the application of resource-based view to inter-organizational relations of businesses. Furthermore, they applied this relational aspect of resource-based view to "supply chain wide collaboration. However, this view has been criticized for failing to propose strategies for organizations to acquire the resources required for growth and achieving competitive advantage. Another criticism to this view is that it is mostly concerned with the tangible resources.

2.2.3 Strategic Choice Theory

Strategic choice theory emphasizes the role of managers' decisions in organizational outcomes (Child, 1972). Child (1972) traces the origins of strategic choice theory in the

works of researchers in US (Blau, Hage and Aiken, Hal, Lawrence, and Lorsch) and UK (Pugh and Woodward). This theory is concerned with the decision-making in organizations for achieving the defined goals. This theory seeks to provide answers to some the aspects of supply chain management studies such as (Ketchen and Hult, 2007): direct and indirect effects of supply chain decision-making on profitability and stock prices; adaptation of organizational supply chain strategies to organizational lifecycle (Miles, Snow, Meyer and Coleman, 1978); supply chain strategies that can address various organizational strategies [for example those proposed by Miles, Snow, Meyer and Coleman (1978) (defenders, prospectors, analyzers and reactors), Porter (1980) (differentiation, cost leadership and focus), Walker, and Ruekert (1987) (prospectors, differentiated defenders and low cost defenders)]; and the conditions that made each of these strategies to be more effective.

Ketchen and Hult (2007) consider strategic choice theory as an appropriate theory for describing 'strategic supply chain management' studies. According to these authors, strategic choice theory with focus on best value selection, can describe: the extent to which 'best value supply chain' models can affect the organizational outcome –in comparison to 'traditional supply chain'; and the extent to which 'best value supply chain' models can 'enact their environment' –in comparison to 'traditional supply chain'. However, unlike "externally focused approaches such as institutional theory" the strategic choice theory focuses on strategies at intra-organizational level to provide certain capabilities such as agility and adaptability (Ketchen and Hult, 2007). This theory is therefore relevant in the study of cement industry in Kenya as the choices the managers

of these firms take on what SCM strategies to employ will impact on the performance of the SCM.

2.2.4 Agency Theory

Agency theory seeks to explain relationships wherein one party (the principal) delegates authority to a second party (the agent). Such relations create the possibility of abuse of power by agents (Eisenhardt, 1989), and are found throughout supply chains. Agency theory might help us understand under what conditions a supply chain member is likely to attempt to exploit other members. Further, the theory could guide investigation of the effects of such opportunism on supply chain effectiveness, as well as revealing how opportunism within supply chains can be prevented or minimized. The agency theory was promoted with the seminal works of Max Weber (Beckert, and Zafirovski, 2006). The classic view of agency theory –as develop by the works of Max Weber and others– was mostly concerned with the conflict of interest between the political master and state officials. This view was built on the foundation of the neoclassical view of organization – that views organizations as black boxes of operations–, where the "relationship between performance and incentives" was overlooked (Beckert, and Zafirovski, 2006).

New institutionalism view of organizations opened the black box of organizational operations and paved the way for the contemporary view of agency theory. In the old institutionalism view, opportunistic behavior based on the rational system view was dominant. However, the new institutionalism view of the organizations, promotes the delegation of responsibilities and operation, through an open system view towards the

environment. The agency theory –from either classical or neoclassical perspectives– provides contributions to the understanding of supply chain management. Agency theory has been applied to various activities associated supply chain management including, outsourcing (Logan, 2000; Loebbecke and Huyskens, 2009), sourcing (Shook, Adams, Ketchen and Craighead 2009), and supply chain collaboration (Kwon and Suh, 2004). Agency theory is useful in the study of SCM in the cement industry as it informs why the firms opt to use distributors or agents to supply the products.

2.3 Empirical Literature

This section reviews literature on supply chain management practices as well as prior empirical studies on supply chain management practices.

2.3.1 Supply Chain Management Practices

Owing to SCM's interdisciplinary origin, there have been various definitions of SCM (Li et al., 2006). The SCM concept was derived from the areas of purchasing and supply management, and transportation and logistics management (Li et al., 2006; Tan et al., 1998). From a purchasing and supply management perspective, Li et al. (2006) stated that SCM is synonymous with the integration of the supply base that evolved from the traditional purchasing and materials functions. Others who defined SCM from the purchasing perspective include Wisner and Tan (2000) and Reck and Long (1988) and they stated that SCM is a basic strategic business process, rather than a specialized supporting function. From the perspective of transportation and logistics management however, SCM is synonymous with integrated logistics systems, and focuses on inventory reduction both within and across organizations in the supply chain (Fisher, 1997; Lamb, 1995).

In this respect, SCM "incorporates logistics into the strategic decisions of the business" (Carter and Ferrin, 1995). These two perspectives were eventually combined into the concept of integrated SCM that bring together all the activities along the whole supply chain (Li et al., 2006; Tan et al., 1998Tan et al., 1998). Based on such integrated SCM concept, SCM is defined by Shimchi-Levi et al. (2000) and Park and Krishnan (2001) as a set of approaches utilized to efficiently integrate suppliers, manufacturers, warehouses, and stores, so that merchandise is produced and distributed at the right quantities, to the right location, and at the right time, in order to minimize system-wide costs while satisfying service level requirements.

Owing to the evolutionary nature and complexity of SCM, many SCM research studies have focused only on the upstream or downstream aspects of SCM. To address the limitations of the existing literature, Li et al. (2005) came up with a unifying SCM practices framework that includes both the upstream and downstream sides of the supply chain. Other researchers who agreed that SCM practices need to cover both upstream and downstream aspects of SCM include Ballou et al. (2000) and Petrovic-Lazarevic et al. (2007).

Li et al. (2005) defined SCM practices as the set of activities that organizations undertake to promote effective management of the supply chain. SCM practices are described by Donlon (1996) as practices that include supplier partnership, outsourcing, cycle-time compression, continuous process flow and information technology (IT) sharing. Alvarado and Kotzab (2001) defined SCM practices in terms of reducing duplication effects by

focusing on core competencies, and use of inter-organizational standards such as activity-based costing or EDI, and eliminating unnecessary inventory levels by postponing customizations towards the end of the supply chain. Kotzab and Schnedlitz (1999) defined SCM practice as a special form of strategic partnership between retailers and suppliers. Sahay and Mohan (2003) proposed that SCM practices to be measured in four dimensions, and they are: alignment between supply chain strategies with business strategies, supply chain integration, partnerships and information technologies. Tan et al. (2002) based on their surveys from senior managers in the USA, summarized SCM practices from the following aspects: supply chain integration, information sharing, supply chain characteristics, customer service management, geographical proximity and IT capability. Chong et al. (2009a, b) studied include IT collaboration tools and supplier relationships in their study on supply chain practices.

Min and Mentzer (2004) identified SCM practices as agreed vision and goals, information sharing, risks and awards sharing, cooperation, integration of process, long term relationship and agreed supply chain leadership. Koh et al. (2007) proposed SCM practices from the following perspectives: close partnership with suppliers, close partnerships with customers, just-in-time supply, strategic planning, supply chain benchmarking, few suppliers, holding safety stock and sub-contracting, e-procurement, outsourcing and many suppliers. Burgess et al. (2006) stated that SCM practices should include leadership, intra-organizational relationships, inter-organizational relationships, logistics, process improvement orientation, business results and outcomes and IT.

Another concept which has gained attention and extended the SCM practices mentioned above is demand chain management (DCM). DCM is defined by Selen and Soliman (2002) as "a set of practices aimed at managing and coordinating the whole demand chain, starting from the end customer and working backwards to the raw material suppliers". DCM focuses on customer needs and links customers and suppliers together into tightly integrated networks (Frohlich and Westbrook, 2002). As Hoover et al. (2001) stated, having competitive products and the right supply chain for the average customer is not enough in the current business environment. The supply chain has to be right for the customer as well. Customer relationships combining with a firm's operation and the customer's operation, makes up a demand-supply chain.

With the availability of e-commerce, an organization's demand-supply chain can be improved. Hoover et al. (2001) stated how Grainger offers business customers a one site-one order-one answer" for office, production and maintenance supplies. A customer company that makes all its purchases through Grainger's web site outsource supplier management and vendor selection processes to Grainger, and simplify its own "internal material handling and accounts payable (Hoover et al., 2001). The key point from demand-SCM is how the relationships between the customers and suppliers are created, maintained and developed. Given that there is a need to integrate customers into the supply chain as demand-SCM and DCM have shown, this study develops SCM practices from the perspectives of upstream, downstream, internal supply chain processes and the customer relationships.

Based on the literature above, SCM practices are portrayed from different perspectives with a common aim of improving organizational performance. In reviewing and consolidating the literature mentioned, six dimensions of SCM practices emerge, namely strategic supplier partnership, customer relationship, information sharing, IT, training and internal operations (Petrovic-Lazarevic et al., 2007; Koh et al., 2007; Li et al., 2005; Perry and Sohal, 2000). Although the dimensions included in this research capture the major aspects of SCM practices, they cannot be considered as complete. Other factors identified in the literature (e.g. supply chain leadership, geographical proximity and supply chain benchmarking) are not included in this research. Although the excluded factors are of great interest, they are not included in this research due to the length of the survey, and the concerns regarding the parsimony of measurement instruments (Li et al., 2006).

A strategic supplier partnership is defined as a long-term relationship between the organization and its supplier (Li et al., 2005). Companies such as Infineon Technologies, IBM, Cisco and Hewlett Packard have worked closely with their suppliers and moved from the early "arm's length" relations to "durable arm's length" relations and strategic partnerships (Chong et al., 2009b). The strategic partnership could involve joint product development and sharing of product demand forecasts. Adopting early supplier involvement, operational activities, such as product development projects, can offer more cost-effective design choices, and select best available components and technologies, resulting in smoother production, improved product quality and reduction in lead time (Tan et al., 2002). Through strategic supplier partnerships, organizations can work

closely with suppliers who can share responsibility for the success of the products (Li et al., 2005). Such strategic supplier partnerships should enable successful SCM.

Customer relationship management (CRM) is an important component of SCM (Noble, 1997; Tan et al., 1999) and involves building and maintaining long-term relationships with customers (Li et al., 2005). Stalk and Hout (1990) stated that maintaining a good customer relationship will enable organizations to be more responsive to customers' needs, thus creating greater customer loyalty, repeat purchase and willingness to pay premium prices for higher quality products. Customer loyalty and customer satisfaction are the main goals of SCM.

The success of a company's SCM depends upon the accuracy and speed of the information provided by each business partner (Chong et al., 2009a). Li et al. (2006) defined information sharing in the supply chain as the extent to which vital and proprietary information is communicated to the company's supply chain partner. Wal-Mart is an example of successful information sharing practices whereby it shares online summaries of point-of-sales data to its close suppliers such as Johnson and Johnson and Lever Brothers (Lee et al., 2000). A successful sharing of useful information between the supply chains partners can result in a reduction of inventory and manufacturing cost, better understanding of customer needs and faster response to market changes (Petrovic-Lazarevic et al., 2007; Stein and Sweat, 1998; Tompkins and Ang, 1999).

The implementation of IT to improve SCM is not something new. IT technologies, such as the EDI, enterprise resource planning and CRM systems can improve supply chain performance. Examples are providing accurate information, improving planning and control of operations for the organizations, as well as indirectly increasing customer satisfaction (Spathis and Constantinides, 2004). IT also helps supply chain members to share information in real time.

2.3.2 Chain Management Practices and Performance

Chong et al (2011) empirically tested a framework which identified the relationships between supply chain management practices, operational performance and innovation performance of Malaysian manufacturing and service firms. Data for the study were collected from a sample of 163 Malaysian manufacturing and service firms. The research model was tested using structural equation modelling. The results showed that SCM practices in both the upstream and downstream supply chain have a direct and significant impact on organizational and innovation performance of Malaysian firms. Innovation improvement caused by SCM also resulted in better organizational performance. The findings also revealed that manufacturing and service firms in Malaysia did not have a significant difference in their SCM practices.

Erol et al. (2010) examined the current state of reverse supply chain management (RSCM) initiatives in several Turkish industries. This study was based on an exploratory research regarding RSCM activities of Turkish automotive, white goods, electric/electronics, and furniture industries. The sample consisted of all the companies

included in the Top-500 Industrial Enterprises List of The Assembly of the Istanbul Chamber of Industry (ISO). The research findings showed that the RSCM initiatives in the considered industries were still in a very early stage. Companies' involvement in product returns were mostly due to the legislative liabilities, and system inadequacies were emphasized as the most important reason for not being able to implement an efficient RSCM.

Wong et al. (2005) sought to explore SCM practices, and identify practical and theoretical gaps in toy supply chains. This study included a longitudinal and in-depth case study during the past year in an international toy manufacturer, which included qualitative semi-structured interviews and questionnaire with 11 main European toy retailers. The study concluded that there are three main SCM practices for toy retailers in terms of ordering behaviours (one-off, JIT, and mixed model), and one dominated SCM practice for toy manufacturers (traditional mass-production or push-models). These low-responsive practices in the toy supply chain are not caused only by slow knowledge diffusion. SCM know-how is not yet capable of managing such levels of volatility and seasonality. Therefore, explanations of these theoretical gaps and what new theories are required for such extreme volatility and seasonality are proposed.

Basnet et al. (2003) reported on a benchmarking study carried out on supply chain management (SCM) activities of manufacturing organisations in New Zealand. A postal survey was carried out to ascertain the status of SCM adoption in New Zealand, and identified the issues in SCM that were significant for New Zealand manufacturers. The

findings suggested that although there is awareness of the SCM concept in New Zealand, the adoption of the newer concepts of SCM was not very far advanced.

Tracey et al. (2005) empirically tested the impact of supply-chain management (SCM) capabilities on business performance so as to determine to what degree customer-oriented SCM issues influence competitive position and organizational performance. A rigorous methodology was employed to generate a reliable and valid measurement instrument. Responses from 474 manufacturing managers were then utilized to test a causal model using LISREL. The results indicated significant positive relationships exist among three types of SCM capabilities (outside-in, inside-out, and spanning) and business performance (perceived customer value, customer loyalty, market performance, and financial performance).

Kim (2006) examined the causal linkages among supply chain management (SCM) practice, competition capability, the level of supply chain (SC) integration, and firm performance. From the results of LISREL analysis on small and large manufacturing firms, the study found that, in small firms, efficient SC integration may play a more critical role for sustainable performance improvement, while, in large firms, the close interrelationship between the level of SCM practices and competition capability may have more significant effect on performance improvement. The study concluded that, in early stage, the emphasis on systemic SC integration may be more crucial. Once SC integration has been implemented, it may be advisable to focus on SCM practice and competition capability.

Kwon and Suh (2005) examined the relationships between the level of trust and several relevant constructs drawn from transaction cost analysis (such as asset specificity, behavioral uncertainty, and partner's opportunism) and social exchange theory (informational sharing). A comprehensive questionnaire based on various theories on trust and commitment was mailed in 2001 to supply chain practitioners in the Midwest region. A total of 171 valid returns were received out of 1,800 mailings (9.5 percent). A path analysis was used to estimate parameters or relationship between relevant constructs and trust, and trust with the level of commitment. The study found that a firm's trust in their supply chain partner is highly associated with both parties' specific asset investments and social exchange theory. Information sharing has a primary impact on reducing (improving a partner's uncertainty behavior which, in turn, would improve the level of trust. Finally, the level of commitment is strongly related to the level of trust, supporting Morgan and Hunt's hypothesis.

Awino and Gituro (2009) focused on SCM best practices in large private manufacturing firms in Kenya. The preliminary tests employed the use of Kaiser Mayer-Olkin (KMO) and Bartlett's Test. A sample of 52 large private manufacturing companies, which are members of Kenya Association of Manufacturers (KAM) was used. To establish SCM best practices, 39 variables were used to measure the level of application among these firms. The variables were analyzed using factor analysis procedure to achieve a simple and meaningful structure, that is, have a nonzero loading of the explained variance for each individual factor, varimax rotation was done. As a result, 11 critical factors were established as the best practices: operating policies, linkages within supply chain firms,

improved performance, information technology systems, strategic alliance, performance measures, goal orientation, customer relationships, guidelines and procedures, supplier selection and supplier evaluation. When benchmarked, these practices were found to be universal and compared with the best practices globally.

2.4 Summary of Literature

The literature review has shown a number of supply chain theories that have been used in prior studies. The literature has also elaborated the practice of supply chain management as well as shown prior empirical results for studies done in various sectors. The closest study in the manufacturing sector is the one by Awino and Gituro (2009) which focused on establishing the SCM best practices in various manufacturing companies in Kenya. The present paper differs from the former because the later focuses solely on the cement industry as not the best practices in the manufacturing sector can be deemed best practice for the cement industry. Secondly, while the former study employed the factor analysis method, the present study builds on the same by focusing on the practices relevant in the cement industry.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the method that is used to carry out the study. It contains research design to be used in the study, the target population, data collection and analysis methods and tools.

3.2 Research Design

This study adopted a survey design. This method was selected because the study seeks to provide a broad overview of green procurement practices in the public sector in Kenya. According to Alreck and Settle (1995), the adoption of survey method is the best as it has the advantage of being suitable for distribution across a wide geographical area and to a large number of organisations.

3.3 Population and Sample

The population was drawn from the cement industry in Kenya. There were currently five players in the cement industry. These are Bamburi, Athi River Mining, East African Portland Cement, National Cement, and Mombasa Cement. These five companies formed the population. A sample of 5 respondents from each of the five companies formed the final sample size. Thus the total sample size was 25 respondents drawn from the procurement departments of the cement companies. These respondents included the procurement managers and 4 other employees from the department. The managers were sampled using purposive sampling method while the rest of the respondents were drawn using simple random sampling method.

3.4 Data Collection

Primary data was collected in this study. The main data collection tool was questionnaires. The questionnaire was divided into 2 sections: demographics section and Supply Chain Management practices section. A five-point Likert scale was used for questions regarding SCM practices as well as for performance. This means that qualitative performance measures were used in the study. These measures used in this study were tested for content validity and reliability through the pre-testing of the questionnaire. Content validity is the technique used to ensure that the measures adequately quantify the concepts that they are supposed to be tested (Sekaran, 2006). Reliability evaluates accuracy of the measures through assessing the internal stability and consistency of items in each variable (Hair et al., 1998).

Validity of the measures was pre-tested on five other manufacturing firms not in the cement industry with the main focus on procurement functions. Their responses on the quality of the questions as well as the comprehensibility of the same were taken into consideration and final amendments made before finally administering the questionnaires to the target respondents. The reliability of measures was pre-tested by computing Cronbach's alpha coefficients on the 5 firms. The alpha was 0.78 thus when checked against the acceptable of 0.60-0.80, it is reliable.

After the pre-testing, modifications were made in the questionnaire to reduce the possibility of ambiguity of some of the questions of the questionnaire before administering it to the respondents as per the target firms. After completing the pre-

testing process, the survey questionnaire was administered using a combination of methods including drop-and-pick later methods, self-administration, and e-mails. A 4 week period was given for the data collection period.

3.5 Data Analysis

Once the data was collected from the field, it was checked for completeness, coded and entered. The entered data was cleaned for any errors before the final analysis began. Section 2, 3 and 4 of the questionnaire were analysed using factor analysis in order to reduce the factors to only significant ones. This also helped in testing the validity of measures used in the study.

The demographic data (section 1) was analysed using descriptive statistics especially the percentages. In order to determine the extent to which firms in the cement industry practice SCM, an analysis of questions relating to this section was done using mean scores and standard deviations.

Correlation and regression analyses were run with SCM as the independent variable and performance as the dependent variable. The regression was performed in order to fulfill objective 2 – the impact of SCM on performance. The results were interpreted based on the r^2, adjusted r^2, significance of F statistic, and the significance of the coefficient of SCM. This whole analysis was aided by the Statistical Package for Social Sciences (SPSS).

CHAPTER FOUR: DATA ANALYSIS AND PRESENTATION

4.1 Introduction

This chapter presents the results of the study. The analysis was performed on 18 questionnaires collected. The response rate was therefore 72%. This chapter is organised as follows. Section 4.2 shows the sample characteristics. Section 4.3 presents the results on supply chain management practices in the cement industry. Section 4.4 presents the results on the impact of supply chain management practices on firm performance.

4.2 Sample Characteristics

This section presents the results on the sample characteristics of the respondents. More specifically, the section presents the results on the length of service the respondents had been working in the organisation and also the number of employees in the cement firms surveyed.

The study found that the length of time the respondents had been working in the organisations ranged from a minimum of 3 years to a maximum of 11 years with a mean of 5.3 years and a standard deviation of 3.1 years. On the number of employees in the organisations, this ranged from a low of 470 employees to a maximum of 622 employees with a mean of 546 employees and a standard deviation of 80 employees. These results are shown in table 4.1.

Table 4.1: Sample characteristics

Sample characteristics	Minimum	Maximum	Mean	Std. Dev
Length of service in the organisation	3	11	5.3333	3.1
Number of employees	470	622	546	80.1

Source: Researcher (2011)

The results in table 4.1 lead to the conclusion that majority of the respondents had been working in the cement firms for a period of about 5 years hence are were aware of the issues of supply chain management in the organisation. The number of employees was also large in these organisations pointing to the industry's role in employment creation.

4.3 Supply Chain Management Practices

The respondents were asked to state the extent to which supply chain management practices had been adopted by their firms. These results are shown in two parts. Section 4.3.1 shows the descriptive results while section 4.3.2 shows the factor analysis results.

4.3.1 Adoption of Supply Chain Management Practices

The descriptive results are shown in table 4.2. As shown by the mean scores, most of the practices scored mean of 3 and above suggesting their adoption. The mean scores reveal the extent to which the respondents agreed with the factors while the standard deviation show the variance in responses. As such, the most common practices were: common set of operating policies, written contracts, clear guidelines and procedures for creating alliances, and supplier screening among other practices. The least adopted SCM practices were empowerment of middle managers to make operation decisions, evaluation of customer relationships on the basis of their profitability, and use of clear guidelines and procedures for monitoring alliances.

Table 4.2: Supply Chain Management Practices

SCM Practices	Mean	Std. Dev
A common set of operating policies are shared by member of the SC	4.7778	.42779
A written agreement or contract is an integral part of all alliances	4.7778	.42779
Clear guidelines and procedures used for creating alliances	4.5556	.51131
Suppliers are carefully screened and assessed before they are selected	4.5556	.51131
Overall SC core competencies have improved over past 3 years	4.5000	.51450
Strategic objectives are closely aligned among members of the SC	4.3333	.84017
Overall SC core capabilities have improved over past 3 years	4.2778	.46089
Information applications are integrated within the firm	4.2222	.87820
Current information systems satisfy SC communication requirements	4.1111	.67640
Operating goals are consistent among SC members	4.0556	.72536
Significant investments are being made in enterprise-wide information systems	4.0556	.72536
Overall strategies in SCM have improved over past 3 years	4.0000	.76696
Information systems are highly integrated throughout the SC	3.7778	.42779
My firm has adopted a key account approach for managing its best customers	3.7778	.87820
Value-added resources are shared among SC members	3.7778	.87820
Significant investments are made in application-specific information systems	3.6111	1.14475
Efforts of increase inter-functional coordination over the past 3 years	3.5556	.85559
My firm's aggressively seeks to understand customers' requirements	3.5556	.92178
Adequate information systems linkages exist with customers	3.5000	.78591
Customer alliances operate under principles of shared rewards and risks	3.5000	.51450
High level of trust have been established with important customers	3.5000	.51450
My firm understands the competitive comparatives throughout the SC	3.5000	.51450
Consistent performance measures are used across different dept/functions	3.4444	.92178
Adequate information systems linkages exist with suppliers	3.3333	1.45521
More process-oriented performance measures tracked today than 3 years ago	3.2778	1.17851
More SC performance measures tracked today than 3 years ago	3.2778	1.17851
Supplier alliances operate under principles of shared rewards and risks	3.2778	.46089
The internet is emerging as key tool to manage customer and supply linkages	3.2778	1.17851
Supplier performance is closely monitored and is the basis for future business	3.2222	.87820

SCM Practices	Mean	Std. Dev
My firm customizes products and/or services for important customers	3.0556	1.30484
Clear guidelines and procedures used for monitoring alliances	2.9444	.53930
Customer relationships are evaluated on the basis of their profitability	2.9444	.72536
Middle managers are empowered to make operation decision than 3 years ago	2.8333	1.09813
My firm is flexible in terms of accommodating customer's special requests	2.8333	.85749
Our firm is more loyal to its employees than 3 years ago	2.5556	.92178
My firm regularly solicits customer input	2.5000	.51450
Employers are more loyal to our organization today than 3 year ago	2.2778	.46089
Non-management employees are more empowered to make operating decisions	2.0556	.72536

Key: 1 = 'Not at all'; 2 = 'Least extent; 3 = 'Moderate extent'; 4 = 'Large extent'; 5 = 'Very large extent'

Source: Researcher (2011)

The study also sought to establish how the cement firms managed their supply chains. The research findings indicated that 12.9% of the firms have close partnerships with suppliers, 9.4% have close partnership with their customers, 12.9% subcontract, and another 12.9% have few suppliers. This is show in table 4.3.

Table 4.3: How cement firms manage their supply chains

	Responses	
	N	Percent
Close partnership with suppliers	18	12.9%
Close partnership with customers	13	9.4%
JIT supply	9	6.5%
e-procurement	5	3.6%
EDI	5	3.6%
Outsourcing	13	9.4%
Subcontracting	18	12.9%
Plan strategically	13	9.4%
Supply Chain Benchmarking	9	6.5%
Vertical integration	4	2.9%
Few suppliers	18	12.9%
Holding safety stock	9	6.5%
Use of external consultants	5	3.6%

Source: Researcher (2011)

The respondents were also asked to state whether their companies had separate logistics department. The results show that all the companies had a separate logistics department. On whether the companies had clear logistics strategic plans, the results in table 4.4 show that 72.2% had while 27.8% did not.

Table 4.4: Existence of clear logistics strategic plan

	Frequency	Percent
Yes	13	72.2
No	5	27.8
Total	**18**	**100.0**

Source: Researcher (2011)

The respondents were further asked to state their opinion on how successful their companies were in managing supply chain in general. The results in table 4.5 show that 72.2% of the respondents said they were successful while 27.8% said they were not successful.

Table 4.5: Successfulness of SCM

	Frequency	Percent
Somewhat successful	5	27.8
Successful	13	72.2
Total	**18**	**100.0**

Source: Researcher (2011)

The respondents were further asked to state what should be done to manage supply chain better. The responses are shown in table 4.6. The results show that the respondents recommended the use of many suppliers, subcontracting, and use of external experts.

Table 4.6: Recommendations for better performance

	Mean	Std dev
Many suppliers	4.0000	.00000
Subcontracting	3.5556	.52705
Use of external consultants	3.4444	.52705
Supply Chain Benchmarking	2.9231	.86232
JIT supply	2.5000	.51450
EDI	2.3077	.48038
Few suppliers	2.2222	1.30859
Vertical integration	2.1667	.85749
Outsourcing	1.8889	1.02262
Holding safety stock	1.8889	1.05409
Plan strategically	1.7778	.87820
e-procurement	1.6923	.48038
Close partnership with suppliers	1.4444	.85559
Close partnership with customers	1.0000	.00000
3PL	1.0000	.00000

Source: Researcher (2011)

4.4 Supply Chain Management and Firm Performance

4.4.1 Descriptive Analysis

The respondents were asked to rank on a scale of 1-5 the successfulness of strategic partnership with suppliers in terms of a number of issues. The results show that the most successful strategic partnership was in reduction in inventory levels followed by improving cooperation and communication. Least success was experienced in terms of improvement of firm profitability and quality of products and services. These results are shown in table 4.7.

Table 4.7: Firm performance

	Mean	Std. Dev
Reducing inventory levels	4.2778	.46089
Improving co-operation and communication	4.2222	.42779
Improving your firm's profitability	3.8333	1.09813
Improving the quality of products/services	3.8333	1.09813

Source: Researcher (2011)

On whether the firms had been successful in managing their supply chains, the study found that 27.8% said the firms were somewhat successful while 72.2% said that they were successful. These results are shown in table 4.8.

Table 4.8: Success in managing supply chain

	Frequency	Percent
Somewhat successful	5	27.8
Successful	13	72.2
Total	**18**	**100.0**

Source: Researcher (2011)

4.4.2 Correlation Analysis

Table 4.9 presents the results of correlation analysis. The dependent variables are profitability, quality, inventory levels, and co-operation & communication. The independent variables were the SCM practices.

The results in table 4.9 show that most of the supply chain management practices had a significant influence on performance measures. For instance, information systems linkages with suppliers had a significant impact on profitability, quality of products, and cooperation and communication at 1% level. Clear guidelines and procedures for creating alliances had a significant impact on all the performance measures. The same was true for customer alliance operating under shared rewards and risks, information applications being integrated within the firm, firm flexibility in terms of accommodating customer special requirements, regular soliciting of customer inputs, and screening and assessment of suppliers before selection. The rest of the correlations can be observed from the table.

Table 4.9: SCM practices Correlation matrix

SCM Practices	Profit	Quality	Inventory	Coop
A common set of operating policies are shared by member of the SC	-.083	-.083	.331	.286
A written agreement or contract is an integral part of all alliances	-.083	-.083	.331	.286
Adequate information systems linkages exist with customers	-.034	-.034	-.406	-.175
Adequate information systems linkages exist with suppliers	.810**	.810**	.292	-.882**
Clear guidelines and procedures used for creating alliances	.698**	.698**	.555*	-.598**
Clear guidelines and procedures used for monitoring alliances	-.017	-.017	.066	.057
Consistent performance measures are used across different dept/functions	-.097	-.097	.385	.331
Current information systems satisfy SC communication requirements	.026	.026	-.105	-.090
Customer alliances operate under principles of shared rewards and risks	.677**	.677**	.620**	-.535*
Customer relationships are evaluated on the basis of their profitability	-.603**	-.603**	.049	.800**
Efforts of increase inter-functional coordination over the past 3 years	-.083	-.083	.331	.286
Employers are more loyal to our organization today than 3 year ago	.678**	.678**	1.000**	-.331
Our firm is more loyal to its employees than 3 years ago	.678**	.678**	1.000**	-.331
High level of trust have been established with important customers	-.156	-.156	.620**	.535*
Information applications are integrated within the firm	-.752**	-.752**	-.888**	.487*
Information systems are highly integrated throughout the SC	-.083	-.083	.331	.286
Middle managers are empowered to make operation decision than 3 years ago	.220	.220	.678**	.083
More process-oriented performance measures tracked today than 3 years ago	.492*	.492*	.933**	-.130
More SC performance measures tracked today than 3 years ago	.492*	.492*	.933**	-.130
My firm's aggressively seeks to understand customers' requirements	.678**	.678**	1.000**	-.331
My firm customizes products and/or services for important customers	.417	.417	.951**	-.023
My firm has adopted a key account approach for managing its best customers	-.346	-.346	-.565*	.139
My firm is flexible in terms of accommodating customer's special requests	.781**	.781**	.868**	-.535*
My firm regularly solicits customer input	.677**	.677**	.620**	-.535*
My firm understands the competitive comparatives throughout the SC	-.156	-.156	.620**	.535*
Non-management employees are more empowered to make operating decisions	.382	.382	.831**	-.042
Operating goals are consistent among SC members	.012	.012	-.049	-.042
Overall strategies in SCM have improved over past 3 years	.349	.349	.832**	.000
Overall SC core capabilities have improved over past 3 years	.678**	.678**	1.000**	-.331

SCM Practices	Profit	Quality	Inventory	Coop
Overall SC core competencies have improved over past 3 years	-.156	-.156	.620**	.535*
Significant investments are made in application-specific information systems	.694**	.694**	.217	-.774**
Significant investments are being made in enterprise-wide information systems	.012	.012	-.049	-.042
Strategic objectives are closely aligned among members of the SC	.383	.383	.506*	-.218
Supplier alliances operate under principles of shared rewards and risks	.678**	.678**	1.000**	-.331
Supplier performance is closely monitored and is the basis for future business	.346	.346	.565*	-.139
Suppliers are carefully screened and assessed before they are selected	.698**	.698**	.555*	-.598**
The internet is emerging as key tool to manage customer and supply linkages	.492*	.492*	.933**	-.130
Value-added resources are shared among SC members	.264	.264	.888**	.139

***Correlation is significant at .01 level*

**Correlation is significant at .05 level*

Source: Researcher (2011).

4.4.3 Regression Analysis

A regression analysis was run in order to establish the impact of supply chain management on firm performance. The dependent variable was performance. The results shown in table 4.10 reveal that supply chain management had a positive and significant influence on performance at 5% level. The model explained 44.5% of variance as shown by adjusted R^2 with an F ratio of 14.606 which was significant at 5% level. Supply chain management accounted for 47.7% of the variance in performance at 5% level (R^2=.477).

Table 4.10: Effect of SCM practices on performance

Variable	Statistic
SE of estimate	.4045
SCM	.910 (.002)
R	.691
R^2	.477
Adjusted R^2	.445
Observations	17
F Statistic	14.606 (.002)

Source: Researcher (2011)

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary and discussion of findings in section 5.2, conclusions of the study in section 5.3, recommendations for policy and practice in section 5.4, limitations of the study in section 5.5 and suggestions for further research in section 5.6.

5.2 Summary and Discussion of Findings

The objectives of this study were: to establish the supply chain management practices in the cement industry in Kenya; and to determine the impact of supply chain management practices on firm performance.

The study found that the most common supply chain management practices in the cement industry were: common set of operating policies, written contracts, clear guidelines and procedures for creating alliances, and supplier screening among other practices. On the other hand, the study noted that the least adopted SCM practices were empowerment of middle managers to make operation decisions, evaluation of customer relationships on the basis of their profitability, and use of clear guidelines and procedures for monitoring alliances.

The finding of the study is also similar to study done by Chong et al (2011) on Malaysian manufacturing and service firms. The results showed that SCM practises in both upstream and down stream supply chain have direct impact on organizational

performance. Tracy et al (2005) indicated positive relationships exist between SCM practises and Business performance.

The study found that all the companies had a separate logistics department and that 72.2% had clear logistics strategic plans. The results showed that that 72.2% of the respondents cited that the SCM practices were successful. The respondents recommended the use of many suppliers, subcontracting, and use of external experts. The most successful strategic partnership was in reduction in inventory levels followed by improving cooperation and communication. This was also confirmed in the study done by Awino and Gituro (2009).

The correlation and regression results showed that supply chain management had a positive and significant influence on performance at 5% level. Supply chain management explained 44.5% of variance as shown by adjusted R^2 with an F ratio of 14.606 which was significant at 5% level. The model explained 47.7% of the variance in performance at 5% level (R^2=.477).

5.3 Conclusion

The study concludes that the supply chain practices in the cement industry can be summarised into three main practices: loyalty, capability, and performance improvement practices; policies, information systems, and supplier linkages; and relationship management.

The study also concludes that supply chain management lead to better performance of companies. Thus, instituting better SCM practices and policies usually translate to better firm performance. The performance is improved in terms of profitability, quality of products and services, reduced inventory levels, and improved cooperation and communication.

5.4 Recommendations

The study makes a number of recommendations. The study recommends that the management of cement firms in Kenya should keep up establishing ways to manage their supply chains better as this has a direct influence on performance. This can be done through the practices such as subcontracting.

Secondly, it is recommended that the supply chain management practices established in this study be adopted by manufacturing firms in Kenya as they lead to better firm performance. Thus managers in other manufacturing firms should incorporate them in order to better manage their supply chains.

Thirdly, the study recommends that IT should be fully developed and utilised by the organisations. Firms should formulate policy framework and guidelines, which will

facilitate the linkage of the joint SCM variables to ensure efficient and effective utilization of resources within the supply chain.

5.5 Limitations of the study

The data collection period took a longer time than was previously envisaged since it was hard to get the managers to fill in the questionnaires. It took the lecturer many visits to the companies' premises to finally get the information needed.

Another limitation was that the model explained less than 50% of the variance in performance meaning that there are a number of factors which were left out in the study that could improve the predictive power of the model used in the study.

5.6 Suggestions for Further Research

The study suggests that this study be replicated to other firms especially the manufacturing sector or the entire firms listed on the NSE to establish whether the practices are the same.

The study also recommends use of secondary data to measure performance of firms in future studies. Such studies should explore a longitudinal survey methodology in order to establish the growth in SCM practices as well as how the same influence performance.

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APPENDICES

Appendix A: Research Questionnaire

Part 1:Demographics

1. How long have you been working in the organisation?

   .....

2. How many employees does the company have?

   .....

3. Which countries, other than Kenya, do you supply to?

   .....

   .....

   .....

   ..

Part 2: Supply Chain Management Practices

4. The following are common supply chain management practices adopted by manufacturing firms. To what extent are these practices carried out in your company? **(Key: 1 = 'Not at all'; 2 = 'Least extent; 3 = 'Moderate extent'; 4 = 'Large extent'; 5 = 'Very large extent').**

	SCM practices	1	2	3	4	5
a.	A common set of operating policies are shared by member of the SC					
b.	A written agreement or contract is an integral part of all alliances					
c.	Adequate information systems linkages exist with customers					
d.	Adequate information systems linkages exist with suppliers					
e.	Clear guidelines and procedures used for creating alliances					
f.	Clear guidelines and procedures used for monitoring alliances					
g.	Consistent performance measures are used across different dept/functions					
h.	Current information systems satisfy SC communication requirements					
i.	Customer alliances operate under principles of shared rewards and risks					
j.	Customer relationships are evaluated on the basis of their profitability					
k.	Efforts of increase inter-functional coordination over the past 3 years					
l.	Employers are more loyal to our organization today than 3 year ago					
m.	Our firm is more loyal to its employees than 3 years ago					
n.	High level of trust have been established with important customers					

o.	Information applications are integrated within the firm					
p.	Information systems are highly integrated through out the SC					
q.	Middle managers are empowered to make operation decision than 3 years ago					
r.	More process-oriented performance measures tracked today than 3 years ago					
s.	More SC performance measures tracked today than 3 years ago					
t.	My firm's aggressively seeks to understand customers' requirements					
u.	My firm customizes products and/or services for important customers					
v.	My firm has adopted a key account approach for managing its best customers					
w.	My firm is flexible in terms of accommodating customer's special requests					
x.	My firm regularly solicits customer input					
y.	My firm understands the competitive comparatives throughout the SC					
z.	Non-management employees are more empowered to make operating decisions					
aa.	Operating goals are consistent among SC members					
bb.	Overall strategies in SCM have improved over past 3 years					
cc.	Overall SC core capabilities have improved over past 3 years					
dd.	Overall SC core competencies have improved over past 3 years					
ee.	Significant investments are made in application-specific information systems					
ff.	Significant investments are being made in enterprise-wide information systems					
gg.	Strategic objectives are closely aligned among members of the SC					
hh.	Supplier alliances operate under principles of shared rewards and risks					
ii.	Supplier performance is closely monitored and is the basis for future business					
jj.	Suppliers are carefully screened and assessed before they are selected					
kk.	The internet is emerging as key tool to manage customer and supply linkages					
ll.	Value-added resources are shared among SC members					

5. If you have strategic partnership with your supplier, how successful is your strategic partnership with suppliers in terms of:

Performance	**1**	**2**	**3**	**4**	**5**
Improving your firm's profitability					
Improving the quality of products/services					
Reducing inventory levels					
Improving co-operation and communication					

Key: **1** = 'Not successful'; **2** = 'Less successful'; **3** = 'Successful'; **4** = 'More successful'; **5** = 'Most successful'.

6. How do you manage your supply chain? *Tick all that apply*

- ☐ 1 Close partnership with suppliers
- ☐ 2 Close partnership with customers
- ☐ 3 JIT supply
- ☐ 4 e-procurement
- ☐ 5 EDI
- ☐ 6 Outsourcing
- ☐ 7 Subcontracting
- ☐ 8 3PL
- ☐ 9 Plan strategically
- ☐ 10 Supply Chain Benchmarking
- ☐ 11 Vertical integration
- ☐ 12 Few suppliers
- ☐ 13 Many suppliers
- ☐ 14 Holding safety stock
- ☐ 15 Use of external consultants
- 16 Other, please specify _____

7. How successful do you think is your company in managing its supply chain in general?

Not successful at all	Not successful	Somewhat successful	Successful	Very successful
☐ 1	☐ 2	☐ 3	☐ 4	☐ 5

8. Which of the following you think that your company needs to do in order to manage its supply chain better? *Tick all that apply.*

	Improve	Start	Satisfied	Not
Close partnership with suppliers				
Close partnership with customers				
JIT supply				
e-procurement				
EDI				
Outsourcing				
Subcontracting				
3PL				
Plan strategically				
Supply Chain Benchmarking				
Vertical integration				
Few suppliers				
Many suppliers				
Holding safety stock				
Use of external consultants				
Other (*specify)*				

9. Does your company have a separate logistics department? ☐ YES ☐ NO

10. Does your company have a clear logistics strategic plan? ☐ YES ☐ NO

Thank you for taking part in the survey

Appendix B: SCM Communalities

	Initial	Extraction
A common set of operating policies are shared by member of the SC	1.000	1.000
A written agreement or contract is an integral part of all alliances	1.000	1.000
Adequate information systems linkages exist with customers	1.000	.834
Adequate information systems linkages exist with suppliers	1.000	.984
Clear guidelines and procedures used for creating alliances	1.000	.999
Clear guidelines and procedures used for monitoring alliances	1.000	.039
Consistent performance measures are used across different dept/functions	1.000	.998
Current information systems satisfy SC communication requirements	1.000	.915
Customer alliances operate under principles of shared rewards and risks	1.000	.999
Customer relationships are evaluated on the basis of their profitability	1.000	.998
Efforts of increase inter-functional coordination over the past 3 years	1.000	1.000
Employers are more loyal to our organization today than 3 year ago	1.000	1.000
Our firm is more loyal to its employees than 3 years ago	1.000	1.000
High level of trust have been established with important customers	1.000	.999
Information applications are integrated within the firm	1.000	1.000
Information systems are highly integrated through out the SC	1.000	1.000
Middle managers are empowered to make operation decision than 3 years ago	1.000	1.000
More process-oriented performance measures tracked today than 3 years ago	1.000	1.000
More SC performance measures tracked today than 3 years ago	1.000	1.000
My firm's aggressively seeks to understand customers' requirements	1.000	1.000
My firm customizes products and/or services for important customers	1.000	1.000
My firm has adopted a key account approach for managing its best customers	1.000	.999
My firm is flexible in terms of accommodating customer's special requests	1.000	1.000

My firm regularly solicits customer input	1.000	.999
My firm understands the competitive comparatives throughout the SC	1.000	.999
Non-management employees are more empowered to make operating decisions	1.000	1.000
Operating goals are consistent among SC members	1.000	.999
Overall strategies in SCM have improved over past 3 years	1.000	.999
Overall SC core capabilities have improved over past 3 years	1.000	1.000
Overall SC core competencies have improved over past 3 years	1.000	.999
Significant investments are made in application-specific information systems	1.000	.998
Significant investments are being made in enterprise-wide information systems	1.000	.999
Strategic objectives are closely aligned among members of the SC	1.000	.999
Supplier alliances operate under principles of shared rewards and risks	1.000	1.000
Supplier performance is closely monitored and is the basis for future business	1.000	.999
Suppliers are carefully screened and assessed before they are selected	1.000	.999
The internet is emerging as key tool to manage customer and supply linkages	1.000	1.000
Value-added resources are shared among SC members	1.000	1.000

Extraction Method: Principal Component Analysis.

Appendix C: SCM total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	17.726	46.648	46.648	17.726	46.648	46.648	17.047	44.861	44.861
2	13.385	35.223	81.871	13.385	35.223	81.871	11.423	30.060	74.921
3	5.639	14.839	96.710	5.639	14.839	96.710	8.280	21.789	96.710
4	.974	2.563	99.273						
5	.178	.469	99.742						
6	.090	.236	99.978						
7	.008	.022	100.000						
8	1.308E-15	3.443E-15	100.000						
9	1.242E-15	3.268E-15	100.000						
10	1.099E-15	2.892E-15	100.000						
11	6.328E-16	1.665E-15	100.000						
12	5.129E-16	1.350E-15	100.000						
13	3.476E-16	9.148E-16	100.000						
14	2.593E-16	6.824E-16	100.000						
15	1.765E-16	4.644E-16	100.000						
16	1.178E-16	3.099E-16	100.000						
17	1.062E-16	2.794E-16	100.000						
18	7.281E-17	1.916E-16	100.000						
19	2.387E-17	6.281E-17	100.000						
20	1.526E-17	4.015E-17	100.000						
21	4.362E-18	1.148E-17	100.000						

22	1.262E-18	3.322E-18	100.000		
23	1.620E-50	4.264E-50	100.000		
24	-8.428E-34	-2.218E-33	100.000		
25	-1.797E-32	-4.728E-32	100.000		
26	-2.403E-18	-6.324E-18	100.000		
27	-4.250E-18	-1.118E-17	100.000		
28	-1.386E-17	-3.646E-17	100.000		
29	-2.172E-17	-5.715E-17	100.000		
30	-4.300E-17	-1.132E-16	100.000		
31	-1.610E-16	-4.238E-16	100.000		
32	-2.219E-16	-5.840E-16	100.000		
33	-2.499E-16	-6.575E-16	100.000		
34	-3.568E-16	-9.389E-16	100.000		
35	-4.357E-16	-1.147E-15	100.000		
36	-6.066E-16	-1.596E-15	100.000		
37	-1.373E-15	-3.614E-15	100.000		
38	-1.641E-15	-4.320E-15	100.000		

Extraction Method: Principal Component Analysis.

Appendix D: SCM Screeplot