SUPPLY CHAIN MANAGEMENT PRACTICES AND PERFORMANCE OF CEMENT COMPANIES IN KENYA

BY

ERNEST MAHULO

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DECLARATION

This management research project is my original work and has not been presented for any academic credit in this or any other university.

ERNEST MAHULO

D61/60647/2010

Signed…….. Date…….

This management research project has been submitted for examination with my approval as a University Supervisor.

Signed…… Date……

ONDIEK

Lecturer,

Department of Management Science,

School of Business, University of Nairobi

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Above all, I thank the almighty God for his enduring love.

DEDICATION

Dedicated to my beloved mother, Sabina Okumu for her steadfast hope and faith

ABSTRACT

Supply chain management has emerged as a common practice across industries because it encompasses long-term strategic alliance, supplier-buyer partnerships, cross-organizational logistics management, joint planning, control of inventory, and information sharing. The study sought to investigate supply chain management practices and organizational performance among cement companies in Kenya. The study adopted a cross-sectional design and was guided by the following objective: to establish the relationship between supply chain management practices and performance of cement companies in Kenya. Both primary and secondary data was utilized in the study. Primary data was collected using a semi-structured questionnaire while secondary data was obtained from the annual financial reports of the respective companies. A census approach was adopted with the sampling frame consisting of all the cement firms in Kenya. A 5-point Likert scale was used to measure the output of each item answered by the participants. Both descriptive and inferential statistics were used to describe (and analyse) the variables numerically. Descriptive statistics were used to describe (and analyse) the variables numerically. Using SPSS version 21 package, a Multivariate regression model was used to analyse the relationship between supply chain management and organizational performance among the cement firms in Kenya. The regression outcome indicates that supply chain management practices have had a significant influence on the organizational performance of cement firms in Kenya during the period under study. The outcome of the study thus establishes a near perfect positive relationship between supply chain management practices and the organizational performance of the cement firms in Kenya with the regression analysis yielding Coefficient of Multiple Determination (R^2) of 0.803 implying that up to 80.3% of the variation in the organizational performance of the cement firms in Kenya can be attributed to the supply chain management practices they have adopted over time. The p-value of 0.001 indicates that there impact of supply chain management practices on the organizational performance of cement firms in Kenya is significant at the 95% confidence level. Given the fact that 16.7% of the firms have are yet to establish a supply chain management framework the study recommends that management of all cement companies in Kenya consider establishing a supply chain management framework to enhance their competitiveness. The study further recommends that firms in Kenya foster collaborative private and public research in designing the scope and functionality of a supply chain management framework specifically tailored to the Kenyan macro-environment to enhance supply chain and overall organizational performance. The study was limited to the extent that, a study of this magnitude should have included a survey of a sizeable number of firms. However time and material resources did not make this feasible. On the other hand, the study period was a little bit narrow for a study of this nature. According to the study, research efforts involving confirmatory factor analysis need to be carried out to further test the model so established and to confirm the findings of the study. Further studies can be conducted to test and confirm the factor loadings in different industrial firms so as to establish the validity and strength of the model. In the same context, there is need for further research to focus on the critical success factors in the adoption of best practice supply chain management models.

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Acronym	Description
EDI	Electronic Data Interchange
e-SCM	Electronic Supply Chain Management
GSM	Green Supply Chain Management
PCC	Per Capita Consumption
SCM	Supply Chain Management
SCO	Supply Chain Orientation

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The last three decades has seen an increasing need to shift from Lean, cost, efficiency-driven supply chains to agile, fast, and service driven supply chains. Both in theory and practice, numerous scholars concur that firms' leaders have become aware that they can no longer productively compete in isolation of their suppliers and other entities in the supply chain (Gimeze & Ventura, 2005; Lee & Billington, 1992). Thus, organizations have shifted their attention from competition amid a field of companies to competition amid their entire supply chains. Failure in the performance of a firm's supply chain results in competitive losses and can ultimately lead to collapse (Greif, 1993). This situation has forced firms to become more focused on their supply chain management capability as a means to improve or sustain their competitiveness (Ntayi & Eyaa, 2010).

Supply chain management has emerged as a common practice across industries because it encompasses long-term strategic alliance, supplier-buyer partnerships, cross-organizational logistics management, joint planning, control of inventory, and information sharing (Ralston, 2013). The goal should be to ensure that the supply chain gratifies the needs of the ultimate buyers of the products or services that it produces (Preuss, 2005). The current study will be informed by the following theories: the 'collaborative paradigm'/relational view (RV) of firms (Dyer and Singh 1998; Duschek 2004) which complements the RBV by advocating that "critical resources are not solely housed within a single firm, but may span firm boundaries and be embedded in the inter-firm routines and processes, in the other words, the supply chain" (Seuring et al. 2010). Another key theory is the Purchasing portfolio theory by Kraljic (1983) which developed a convenient portfolio approach for the determination of a comprehensive strategy for

supply. Kraljic's approach includes the construction of a portfolio matrix that classifies purchased products and services on the basis of two dimensions: profit impact and supply risk (''low'' and ''high''). The study will also be informed by the Manufacturing Strategy Theory (Simangunsong et al, 2011). Manufacturing strategy theory incorporates the contingency theory based model, which conceptualizes the relationship between a changing environment, managerial decision making and performance. Similarly, corporate performance is positively related to the role of manufacturing manager in strategic decision making. Alignment between business environment characteristics, competitive priorities and SC structure improve firm performance (Simangunsong et al., 2011).

Besides being a vital sector in the building and construction industry, the cement sector has several special characters which make hedging crucial for market participants. The cement industry is characterized by great price volatilities that expose cement companies to a massive commodity price risk. In addition the cement supply chain includes a lot of challenges due to globalization, long lead times and nature of oil. Furthermore the cement industry is one of the industries that are highly dependent on risk management in its volatile business environment (Miguel et al., 2013). In light of the above, there is need for studies to unravel the various supply chain strategies that firms have or need to adopt in their quest to enhance their competiveness and performance in the cement industry. The current study thus seeks to investigate the various supply chain practices adopted by cement firms in Kenya and their impact on the performance of the companies in the dynamic Kenyan cement market.

1.1.1 Supply Chain Management practices

Supply chain is a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer (Christopher, 1998). Christopher uses the terms "supply network" or "supply web" to describe the net-structure of most of the Supply chains. He emphasizes the network-nature of his supply chain definition (Sillanpää, 2010).

The supply chain encompasses every effort involved in producing and delivering a final product, from the supplier's supplier to the customer's customer. Five basic processes; plan, source, make, deliver and return broadly define these efforts, which include managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer (Supply Chain Council, 2005).

Sillanpää (2010) defines supply chain management as the integration of key business processes from end user through original suppliers that provides products, services, and information that adds value for customers and other stakeholders. Supply chain management theory clearly addresses the limitations in improving demand chain performance through the transfer of demand information when lead-times are long (de Treville *et al.* 2004). Supply chain management is the design of the firm's customer relationship, order fulfillment and supplier relationship processes and the synchronization of these processes of its suppliers and customers in order to match the flow of services, materials and information with customer demand. The purpose of supply chain

management is to design the supply chain and to synchronize the key processes of the firm's suppliers and customers, so as to match the flow of services, materials and information with customer demand (Donlon, 2012).

Although definitions of supply chain management differ across authors, they can be classified into three categories: a management philosophy, implementation of a management philosophy, and a set of management processes. Supply chain management as a management philosophy seeks synchronization and convergence of intra-firm and inter-firm operational and strategic capabilities into a unified, compelling marketplace force (Ross, 1998). Supply chain management as an integrative philosophy directs supply chain members to focus on developing innovative solutions to create unique, individualized sources of customer value. Langley and Holcomb (1992) suggest that the objective of Supply chain management should be the synchronization of all supply chain activities to create customer value (Sillanpää, 2010).

Supply chain management practices have been defined as a set of activities undertaken in an organization to promote effective management of its supply chain (Tomi Solakivi, 2014). The current study will focus on the four main supply chain practices that influence firm performance including: logistics outsourcing; supply chain collaboration; information systems support; and design for postponement. Donlon (2012) describes the latest evolution of supply chain management practices, which include supplier partnership, outsourcing, cycle time compression, continuous process flow, and information technology sharing. Tan et al. (1998) use purchasing, quality, and customer relations to represent supply chain management practices, in their empirical study. Alvarado and Kotzab (2001) include in their list of supply chain management practices

concentration on core competencies, use of inter-organizational systems such as electronic data interchange (EDI), and elimination of excess inventory levels by postponing customization toward the end of the supply chain. Tan et al. (1998) identify six aspects of supply chain management practice through factor analysis: supply chain integration, information sharing, supply chain characteristics, customer service management, geographical proximity and just in-time (JIT) capability. Chen and Paulraj (2004) use supplier base reduction, long-term relationship, communication, cross-functional teams and supplier involvement to measure buyer–supplier relationships. Min and Mentzer 2004 identify the concept supply chain management as including agreed vision and goals, information sharing, risk and award sharing, cooperation, process integration, long-term relationship and agreed supply chain leadership.

In reviewing and consolidating the literature, five distinctive dimensions, including strategic supplier partnership, customer relationship, level of information sharing, quality of information sharing and postponement, are selected for measuring supply chain management practice. The five constructs cover upstream (strategic supplier partnership) and downstream (customer relationship) sides of a supply chain, information flow across a supply chain (level of information sharing and quality of information sharing), and internal supply chain process -postponement (Tomi Solakivi, 2014). In sum the current study aims at investigating how; logistics outsourcing, supply chain collaboration, information systems support, and design for postponement as the key supply chain practices enhance supply chain and organizational performance among the cement companies in Kenya.

1.1.2 Organizational Performance

Performance is the act of doing the work, as well as being about the results achieved. It can be defined as the outcomes of work because they provide the strongest linkage to the strategic goals of an organization, customer satisfaction and economic contributions. The term "Performance Management and Measurement" refers to any integrated, systematic approach to improving organizational performance to achieve strategic aims and promote an organization's mission and values. In that sense Organizational Performance Management is quite different than individual Performance Management which specifically targets the personal performance of an employee although the latter comprises an essential part of the overall organizational performance framework (Akyuz and Erkan, 2010).

A Performance Management system aims at improving the results of people's efforts by linking these to the organization's goals and objectives. It is, ideally, the means through which employees' performance can be improved by ensuring appropriate recognition and reward for their efforts, and by improving communication, learning and working arrangements (Rani and Panchanthan, 2012). Garad and Mohamed (2015) posit that the measurement of organizational performance has undergone changes in relation to its measurement focus. From a uniquely financial perspective, it began to consider other nonfinancial perspectives, as well as to include a cause and effect relation between the operational dimension and the strategic dimension of organizations. Based on this current view, Performance Prism presents itself as a performance measurement system alternative to be used by organizations, with its main focus being the stakeholders in its field of operation (Wallenburg, 2009).

Many Performance Management systems borrow from or utilize some of the new approaches such as “Balanced Scorecard”, “Total Quality Management (TQM), best practice “Benchmarking”, or Business Process Re-engineering (BRP). Performance Measurement must be considered as part of the overall Performance Management system and can be viewed as the process of quantifying the efficiency and effectiveness of actions. It is common practice in public sector performance management literature to talk about the three Es of: Economy, Efficiency, and Effectiveness (Yu et al., 2013).

1.1.3 Supply chain management practices and Organizational performance

Lee (2014) identified five practices which are outsourcing, strategic supplier partnerships, customer relationships, and information sharing as well as product modularity to proof that they are key practices to enhance on the supply chain responsiveness that will lead to improve the organizational performance. Besides, Walton (1996) identified SCM partnership of planning, sharing benefits and burdens, operational information exchange and extendedness as SCM practices while Zhou and Benton (2007) in their study defined that there are only three categories of supply chain practices which are supply chain planning, just in time production and delivery practices. Besides, in the study of Chen and Paulraj (2004), they used long-term relationship, cross-functional teams, supplier base reduction and supplier involvement as SCM practices that will influence on organizational performance. In short, SCM practices are important so that it will help to improve the whole supply chain system and therefore, improving the organizational performance.

According to Li et al (2006), higher levels of supply chain management practice can lead to enhanced competitive advantage and improved organizational performance. Also,

competitive advantage can have a direct, positive impact on organizational performance. The supply chain management framework developed in this study proposes that supply chain management practice has a direct impact on the overall financial and marketing performance of an organization (Shin, 2009). Supply chain management practice is expected to increase an organization's market share, return on investment, and improve overall competitive position. For example, strategic supplier partnership has been reported to yield organization-specific benefits in terms of financial performance (Ling & Huang, 2002; Zhang, 2001). Advanced design and logistic links with suppliers are related to better-performing plants. Customer relation practices have also been shown to lead to significant improvement in organizational performance. The higher level of information sharing is associated with the lower total cost, the higher-order fulfillment rate and the shorter-order cycle time (Wisner, 2001). Organizational performance refers to how well an organization achieves its market-oriented goals as well as its financial goals. The short-term objectives of supply chain management are primarily to increase productivity and reduce inventory and cycle time, while long-term objectives are to increase market share and profits for all members of the supply chain. Financial metrics have served as a tool for comparing organizations and evaluating an organization's behavior over time. Any organizational initiative, including supply chain management, should ultimately lead to enhanced organizational performance (Person, 1999).

Following Thakkar (2009) the current study will adopt the following performance measures: Total SC cost. The cost of fulfillment as a percentage of revenues or cost of fulfillment per case ordered; Service level. This includes fill rate (availability- ratio of number of items ordered by customers and number of items delivered to customers), operational performance (in terms of average order cycle time, consistency of order cycle

time and/or on-time deliveries. and service reliability (deals with accuracy of work in order entry, warehouse picking, document preparation, etc.); Asset management. Utilization of capital investments in facilities and equipment as well as working capital invested in inventory; Customer accommodation. This aims to capture measurement of perfect orders, absolute performance and customer satisfaction; and Cash-to-cash cycle time. This is the time required to convert a dollar spent on inventory into a dollar collected from sales revenue. The overall organizational performance will be measured using Ratio *analysis,* Return on Assets-ROA, and or Return on Equity-ROE (Gökbulut, 2009).

1.1.4 The Cement industry in Kenya

The current study is confined to the cement industry owing to the fact that the quality, cost, and supply of cement are key performance drivers in the building and construction sector. The level of building and construction activities in a country is an indicator of the general economic performance of that economy due to linkages with most other sectors with corresponding demands for materials and labour inputs. Fluctuations in the level of activities of this sector correspond to shifts from consumption to investment in acquisition and creation of fixed assets and vice versa. Infrastructure development is critical for trade, facilitating flow of materials and information, reducing inequalities and poverty, and enhancing economic development(Economic review, 2014).

The Government is giving great emphasis to infrastructure development as evidenced through its budget resource allocations to construction of new roads, bridges, rehabilitation of roads and their periodic maintenance. In 2013, the building and construction sector expanded by 5.5 per cent up from a growth of 4.8 per cent registered

in 2012 (Economic review, 2014). The centrality of the cement industry if further compounded by the fact that; though cement consumption in particular is highly correlated to a country's economic performance, cement consumption experienced superior growth that was more than twice the rate of Gross Domestic Product growth during the period. Growing in tandem with the construction sector, cement consumption increased at an average rate of 14.1% for the period 2006 – 2011, with consumption reaching 3.43 million tonnes (mT) in 2011, up from 1.57mT in 2006 (Miguel, et al,. 2013).

Cement production registered an accelerated growth of 7.8 per cent in 2013 compared to a growth of 4.8 per cent in 2012. This translated into 5,059.1 thousand tonnes in 2013. Cement consumption and stocks also increased from 3,991.2 thousand tonnes in 2012 to 4,266.5 thousand tonnes in 2013 as a result of increased construction activities. For a second consecutive year, imports of cement declined to stand at 34.4 thousand tonnes in 2013. Total exports of cement to Uganda and Tanzania, which had decreased in 2012, reversed to record 594.0 thousand tonnes in 2013 (Economic review, 2014).

Key drivers of this growth in cement consumption included rising demand for housing (which triggered an upsurge in private sector funded housing developments), the commercial construction boom fuelled by increased foreign investment, and extensive government and donor-funded spending on the country's mega infrastructure projects. As a result, per capita consumption (PCC) of cement increased at an average rate of 10.7% for the period to 83.9 kilograms (Kg) in 2011 from 50.0Kg in 2006 despite relative stagnation in annual population growth. The expansion of cement production is due to the entry of new cement producers and extensive capacity expansion by existing players in

response to increasing competition. This rise in production led to the consistent oversupply of cement during this period. Given an estimated industry capacity utilization rate of about 72%1, this glut supply could be much higher were installed capacity fully utilized (Miguel, et al, 2013). The cement industry in Kenya includes six cement companies outlined as indicated in Table 1.1 below;

Table 1.1: a list of the cement Companies in Kenya

	Company	Brand
1	Bamburi Cement Limited	Nguvu cement
2	Athi River Mining company	Rhino cement
3	East African Portland Cement Company Limited (EAPC	Blue triangle cement
4	National Cement Company Limited (NCC)	Simba cement
5	Mombasa Cement Limited (MCL)	Nyumba cement
6	Savannah Cement Company (SCC)	Savannah cement

Source: economic Survey (2014).

Key export markets included Uganda, Tanzania, the Democratic Republic of Congo (DRC) and other East and Central African countries. Imported cement accounted for a marginal 2% of total cement consumed during the period indicating the country's overall reliance on locally produced cement. In 2011, cement import duty under the East African Community Common External Tariff was lowered by 10% to 25% despite stiff opposition from industry players (Economic Review, 2014).

1.2 Research Problem

Higher levels of supply chain management practice can lead to enhanced competitive advantage and improved organizational performance. Supply chain management practice is expected to increase an organization's market share, return on investment, and improve overall competitive position Li et al (2006), For example, strategic supplier partnership has been reported to yield organization-specific benefits in terms of financial performance (Ling & Huang, 2002; Zhang, 2001). The four main supply chain practices that influence firm performance are: logistics outsourcing; supply chain collaboration; information systems support; and design for postponement (Vijayasarathy, 2010).

The centrality of the cement industry to Kenya's economy is compounded by the fact that; though cement consumption in particular is highly correlated to a country's economic performance, cement consumption experienced superior growth that was more than twice the rate of Gross Domestic Product growth during the period. Owing to the volatility of the cement industry, there is need for studies to be conducted to investigate the role of supply management practices in enhancing the performance of the players in the industry, hence the current study.

The relationships between the supply chain practices and the measures of firm performance have been widely studied. Lorentz et al. (2012) measured performance as intra-firm supply chain performance and financial performance, including cost performance, service performance and asset utilization as dimensions of intra-firm supply chain performance, and measuring financial performance as Return on Assets (ROA), Return on Capital Employed (ROCE) and Earnings Before Interest and taxes (EBIT-%). Martin and Patterson (2009) consider performance to include inventory, cycle time and

financial, including asset utilization as one of the dimensions of performance. Their findings however are limited to the extent that not all the performance metrics have been chosen with the supply chain perspective in mind. The current study diverges from their study by seeking to unravel the integrative factor between the best supply chain management practices and supply chain and financial performance.

Locally, Korir (2011) examined the relationships between criteria/influencing factor within the supplier selection and contribution towards the company level of efficiency and overall performance among Oil companies in Kenya and found out that; having an appropriate supplier selection criteria leads to selecting the right supplier which eventually impact in company efficiency and performance. Kimani (2012) carried out a study aimed at developing a model exploring the relationship between supply chain and financial performance by using a structural equation model with vehicle manufacturer. While their findings will provide vital insights into supplier selection criteria, they are limited to the extent that they fail to establish the relationship between selection practices and overall organizational performance which is the domain of the current study.

While past studies have unraveled the impact of supply chain management on supply chain and organizational performance, most of them fail to give a direct analysis of the relationships between supply chain practices and financial performance. Against this backdrop, the current study aims to establish the relationship between supply chain management practices and performance among cement companies in Kenya. The study will seek to answer the following research question: what is the relationship between supply chain management practices and performance of cement companies in Kenya?

1.3 Objective of the study

To establish the relationship between supply chain management practices and performance of cement companies in Kenya.

1.4 Value of the Study

On a knowledge level, Overview of conceptual and theoretical approaches will contribute to understanding of a range of important factors that exist in the business context between purchasing companies and their suppliers. Based on the combination of overviewed approaches, the multi-dimensional framework for analysis of sustainable sourcing practices might be established.

On a theoretical level, some of the results of this thesis will be in line with the mainstream of existing literature, while at the same time some of the findings may challenge the assumptions made in the literature. The thesis also contributes on the methodological level by providing additional information on both the measurement and analysis of firm performance. The study will thus contribute to inductive theoretical development, where explanations observed in the theories will be tested against their suitability in particular context of the cement industry in Kenya.

On the managerial level, the two main messages to practitioners are as follows: First, the connections between supply chain practices and firm performance are dependent on the firm's characteristics, such as firm size, industry and the level of internationalization. With this in mind, rather than trusting readymade recipes for success, management should instead thoroughly analyze what the effects of different practices would be, considering the individual characteristics of their firm. Second, the results may emphasize the key role of Supply Chain Management (SCM). Especially for firms that

have expanded their supply chains beyond the domestic market, it is important to extend their perspective towards suppliers and customers in addition to service providers. Realizing this seems to be an essential factor in the success of the firm.

On policy level, the findings of the study will have policy implications at the firm, industry, and macro levels. The study will definitely provide insights for supply chain managers on the centrality of adopting best practice supply chain management practices as a critical success factor in enhancing supply chain and organizational performance. The results of the study will provide vital information on how companies in Kenya can build their core competencies based on best supply chain practices. In light of this, the findings may provide insights into enhancing firm and national competitiveness through supply chain optimization approaches.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviews theoretical and empirical literature from past studies on the subject of supply chain management practices and organizational performance. The chapter focuses on the following issues;

2.2 Theoretical Framework

This section aims to provide the theoretical overview of existing concepts and theories in supply chain management and buyer-seller relationships literature, which might be of particular relevance to best practice supply chain management and organizational performance. Theoretical overview is conducted in regard to three constituent elements of supply chain management highlighted by Preuss (2005), namely managing material flows, relationship management and managing information flows. The following theories will constitute the theoretical framework of the current study:

2.2.1 Collaborative' paradigm theory

Resource-based view (RBV) of the firm (Wernerfelt 1984; Barney 1991) explains organizational competitive advantage as possession of unique resources and capabilities. Nowadays, with outsourcing of non-core components and competences, resources of two or more organizations are combined through interaction (Gold, Seuring et al. 2010). The resources created through integration in supply chain are of higher value than individual firm's resources. Therefore companies involved in resource integration are granted with more benefits (Haakansson and Snehota 1995; Halldorsson, Kotzab et al. 2007).

In regard to these deliberations, the 'collaborative paradigm'/relational view (RV) of firms (Dyer and Singh 1998; Duschek 2004) complements the RBV by advocating that "critical resources are not solely housed within a single firm, but may span firm boundaries and be embedded in the inter-firm routines and processes, in the other words, the supply chain" (Gold, Seuring et al. 2010). Nowadays, when sustainability has shifted from organizational to supply chain level, it becomes one of the critical resources that cannot be created solely by the efforts of individual company. Inter-firm collaborative relationships help companies creating sustainability resources and competences that otherwise would not be possible to acquire (e.g. sustainability related knowledge via inter-organizational learning, joint environmental solutions as product and process design etc.). Due to unique history and context specificity of relationship development process, created sustainability related resources and competences are not easy for competitors to imitate and thus become a source of inter-organizational competitive advantage (Gold, Seuring et al. 2010).

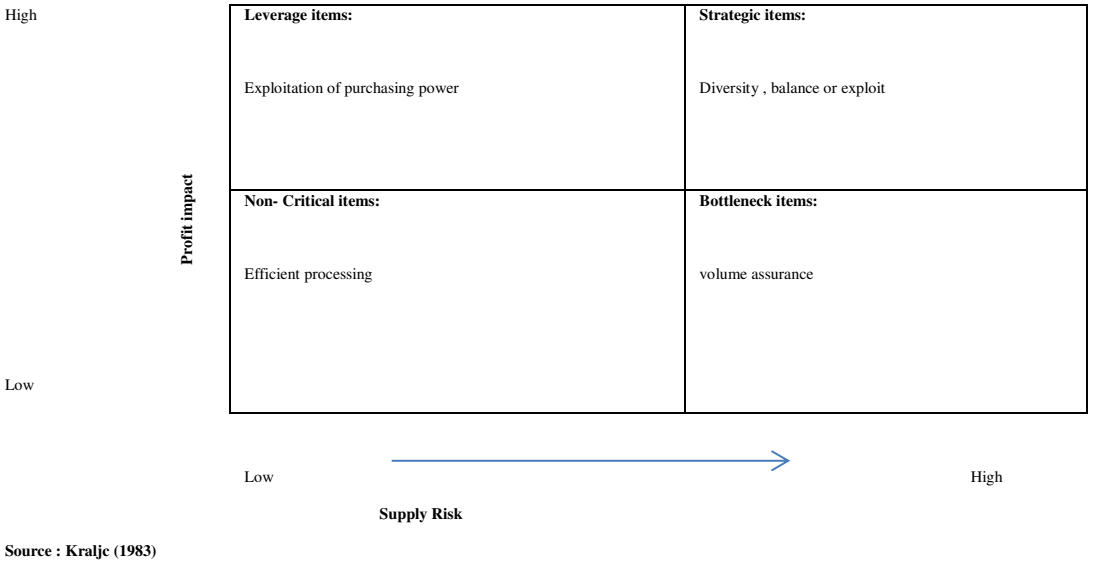
2.2.2 Purchasing portfolio theory

Kraljic (1983) introduced the first comprehensive portfolio approach for the use in purchasing and supply management. Some 20 years ago, he advised managers to guard their firms against disastrous supply interruptions and to cope with changing economic and technological dynamics. His message was that ''purchasing must become supply management.'' In this context, Kraljic (1983) developed a convenient portfolio approach for the determination of a comprehensive strategy for supply. Kraljic's approach includes the construction of a portfolio matrix that classifies purchased products and services on the basis of two dimensions: profit impact and supply risk (''low'' and ''high''). The result is a 2 X 2 matrix and a classification into four categories: bottleneck, noncritical,

leverage and strategic items; see Figure1. Each of the four categories requires a distinctive approach toward supplier management.

Leverage items allow the buying company to exploit its full purchasing power, for instance through tendering, target pricing and product substitution. Routine items are of low value, are ordered frequently and therefore cause high transaction costs. Therefore, strategies are aimed at reducing transaction costs through category management in e-procurement solutions. Bottleneck items cause significant problems and risks that should be handled by volume insurance, vendor supplier control, and safety stock and backup plans. In some cases, a search for alternative suppliers or products is needed. Strategic items require a more collaborative strategy between both the buyer and the seller. The general idea of Kraljic's model is to minimize supply risk and make the most of buying power. Each of the four quadrants allows for differentiated supplier strategies based upon the position of a product in the portfolio as shown in figure 1 below;

Figure1: The Kraljic Matrix: categories and recommendations



Source : Kraljc (1983)

2.2.3 Manufacturing Strategy Theory

Different studies have proposed manufacturing strategy theory to be relevant to SCM research (Simangunsong et al, 2011). Manufacturing strategy theory incorporates the contingency theory based model, which conceptualizes the relationship between a changing environment, managerial decision making and performance (Swamidass & Newell, 1987). Similarly, corporate performance is positively related to the role of manufacturing manager in strategic decision making. Alignment between business environment characteristics, competitive priorities and SC structure improve firm performance (Simangunsong et al, 2011). Decision making in manufacturing strategy reflects how a company intends to compete in the market by making internal choices consistent with their competitive priorities of cost, quality, flexibility, reliability and speed of delivery to achieve global success.

Much of contingency theory postulates that if the environment is dynamic, then it is useful to differentiate the organization and employ more sophisticated integrative devices (Swamidass & Newell, 1987). Surviving in today's highly competitive and rapidly changing environment often requires firms to develop strategies that provide the right kind of flexibility to succeed in their specific environments (Simangunsong et al, 2011).

2.3 Supply Chain Management (SCM)

Fawcet and Magnan (2001) define supply chain management is the collaborative effort of multiple channel members to design, implement, and manage seamless value-added processes to meet the real needs of the end customer. The development and integration of people and technological resources as well as the coordinated management of materials, information, and financial flows underlie successful supply chain integration.

Nayron (1999) defines supply chain as following (Ben Naylor et al. 1999): A supply chain is a system whose constituent parts include material suppliers, production facilities, distribution services and customers linked together via a feed forward flow of materials and feedback flow of information. Stevens (1989) views a supply chain as; a system whose constituent parts include material suppliers, production facilities, distribution services and customers linked together via the feed-forward flow of materials and the feedback flow of information. The supply chain encompasses every effort involved in producing and delivering a final product, from the supplier's supplier to the customer's customer. Five basic processes; plan, source, make, deliver and return broadly define these efforts, which include managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer (Supply Chain Council, 2005).

According to the Supply Chain Council (2005), there are four basic processes in the SC: plan, source, delivery and return. Plan refers to processes that balance aggregate demand and delivery requirements. Sources are processes that transform product to a finished state to meet planned or actual demand. Delivery is a process in which the finished goods are delivered to a customer. Return is defined as processes associated with returning or receiving returned products. A network of companies to which interdependent organizations have linked up can be regarded as a SC. Organizations co-operate in order to control, manage and improve material and information flows from suppliers to end users. A supply chain is described as a chain that creates products or services and forwards them from suppliers to customers. In reality, a SC is not a separate chain. Therefore, a supply network would be more appropriate term to describe a SC. The

network consists of company's partners as well as various suppliers and clients. Also customers of the customers are part of the network that a company builds around it (Christopher 1998).

Supply Chain Management (SCM) is the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders Cooper et al. 1997, Lambert et al. 1998). Christopher (1998) uses the terms "supply network" or "supply web" to describe the net-structure of most of the SC's. According to him, a supply chain is a network of organizations that are involved, through upstream and downstream linkages, in the different processes and activities that produce value in the form of products and services in the hands of the ultimate customer.

SCM encompasses co-operation of various functions between suppliers and customers. Most essential divisions of SCM are those of managing business relations and managing customers. Actual competition takes place along the whole SC when companies involved in the SC have the prerequisites for competitive operations. From the point of view of the SC, moving the orders upstream or downstream does not make the aggregate more competitive. Costs are divided with respect to the whole supply chain by the price requested from the client.

2.4 Supply chain management practices associated with firm Performance

Although literature of SCM practices vary in different view and perspectives, its stand as a mutual understanding purpose of improving organizational performance. Over the literature of reviewing and consolidating that has been pointed out by different researchers, academicians and consultant, there are seven distinctive dimensions of SCM

practices which are widely agreed by researchers and received the most consensuses in the researches. These seven dimensions are outsourcing, strategic supplier partnerships, customer relationships, information sharing, postponement, quality of information sharing and lean practices. Findings from these researchers argued that supply chain management practices can encourage the customer relationship and smooth the information sharing and quality of information sharing flow across the supply chain processes including outsourcing, strategic supplier partnership, lean practices and postponement (Cheng, 2011).

2.4.1 Logistics outsourcing

Traditionally, outsourcing has been seen as one of the possible ways to increase flexibility, enhance performance and cut the costs of operations. One of the first authors to present motives for and against outsourcing were Bettis et al. (1992), who argued that outsourcing could aid competitiveness providing it was managed properly. Among other early contributors to the discussion was Aertsen (1994), one of the first to discuss it from the logistics perspective and to analyze the outsourcing of physical distribution. Also, D'Aveni and Ravenscraft (1994) and Gilley and Rasheed (2000) argue that one of the core motives for outsourcing is the firm's need to concentrate on its core competencies, thereby achieving higher performance (Kremic; Tukel and Rom, 2006).

The relationship between outsourcing and firm performance has also been studied increasingly over the last few years. Kotabe and Mol (2009) identified a curvilinear relationship between the level of outsourcing and firm performance, suggesting that there would be an optimal level of outsourcing, and distractions from it would be costly. Hsiao,

Kemp, van der Vorst and Omta (2010) analyzed the effects of logistics outsourcing on service performance, being unable to find any significant effects.

2.4.2 Supply chain collaboration

Numerous researchers report positive effects of collaboration on performance. For example Bagchi, Ha, Skjoett-Larsen and Soerensen (2005) report these positive effects on logistics costs and operational performance metrics such as perfect order fulfillment rate. Sanders and Premus 2005 report positive effects on a composite measure of firm performance consisting of cost, quality, delivery and new product introduction time.

Cao and Zhang (2010 and 2011) identify positive effects between supply chain collaboration and growth of sales, ROI, growth of ROI and profit margin. Despite the vast amount of research already done on supply chain collaboration, the discipline has been unable to determine a unified definition for it. Stank et al. (2001) and Giménez and Ventura (2005), for example, consider supply chain integration to consist of internal and external integration, whereas Flynn, Huo and Zhao (2010) divide it into three dimensions: customer, supplier and internal. Barratt (2004) provides a detailed description on which activities are considered to be intra-organizational and which are inter-organizational.

Simatupang and Sridharan (2005) divide supply chain integration into three dimensions: information sharing, decision synchronization and incentive alignment. Leuschner, Rogers and Charvet (2012) compiled a meta-analysis on the relationship between supply chain integration and performance, concluding that based on previous literature supply chain integration has three dimensions: information integration, operational integration and relational integration. According to Vereecke and Muylle (2006), firms engage in two forms of collaboration: exchange of information on forecasts, planning, inventory

etc. or alternatively structural collaboration such as installing Kanban systems or co-locating plants.

Most of the previous research assumes a straightforward relationship between supply chain integration and supply chain performance: the more integration, the better the performance but this consensus has also been questioned. For example Das, Narasimhan and Talluri (2006) argue that once a certain threshold level of integration has been reached, increasing integration does not necessarily increase performance. Kampstra, Ashayeri and Gattorna (2006) on the other hand are more concerned about "sub-optimization", in other words the failure of firms to commit enough to collaboration within a single supply chain. In their meta-analysis,

2.4.3 Information systems support

The development of information and communications technology (ICT) has created new possibilities for improving firm performance. For example Brynjolf and Hitt (2000) review the evidence on how investments in (and thus the increased use of) IT influences performance. As part of their definition, Simatupang and Sridharan (2005) include information sharing as one of the dimensions of supply chain collaboration. Assuming that supply chain collaboration has a positive effect on firm performance, the Simatupang and Sridharan (2005) framework can be interpreted such that increased information systems support is linked to better performance by enabling deeper supply chain collaboration.

Most of the previous literature seems to assume an indirect rather than direct impact of IT on performance. Byrd and Davidson (2003) assume that the technical quality of IT and the utilization plan for it, and support by top management for IT development influence

its impact on the supply chain, which in turn affects firm performance. Kent and Mentzer (2003) identify investment in inter-organizational IT as having an effect on logistics efficiency through relationship commitment. For their part, Wu et al. (2006) consider that the alignment and advancement of IT are positively connected to supply chain capabilities, which in turn are tied to both the firm's marketing and financial performance. A direct relationship between IT and performance has been identified. Bayraktar, Demirbag, Koh, Tatoglu and Zaim (2009) detect a significant positive connection between information systems practices and operational performance of small and medium enterprises (SMEs), whereas Dehning et al. (2007) pinpoint a positive relationship between a firm's investment in IT based SCM systems and performance.

2.4.4 Design for postponement

Postponement is defined as the practice of moving forward one or more operations or activities (making, sourcing and delivering) to a much later point in the supply-chain. Two primary considerations in developing a postponement strategy are: (1) determining how many steps to postpone, and (2) determining which steps to postpone. Postponement needs to match the type of products, market demands of a company, and structure or constraints within the manufacturing and logistics system (Rogers and Charvet, 2012).

Postponement is now defined as an organizational concept whereby some of the activities in the supply chain are not performed until customer orders are received, contrary to producing in anticipation of future orders. In the worlds of Venkatesh and Swaminathan (2002) the concept of postponement is to delay the point of commitment of WIP inventory into a particular end product and, thereby, gain leverage in terms of efficient asset utilization in a dynamic uncertain environment. Postponement is also referred to as

end of line configuration, late point differentiation, or delayed product differentiation (Lee, 1993). During the last two decades several modeling approaches of postponement have appeared in the literature.

Rogers and Charvet (2012) presented a process standardization model where all products follow a series of common steps, after the completion of which products are differentiated, the point where the common process finishes and the differentiation starts is called differentiation point. They showed that when costs are identical at each site order-up-to is the optimal inventory policy. Lee (1996) also considered a process standardization model assuming that all products have independent demands following a normal distribution while the system follows a periodic review policy with complete backlogging. The author showed that postponement will lead to reduction of finished goods inventory. Lee and Whang (1998) investigated a similar model assuming demands follow a random walk and that demand forecast accuracy may be improved due to postponement. The authors proved that the safety stock decreases as the point of differentiation moves at a later stage. In the above models only finished products may be held as inventory.

2.5 Empirical literature

As presented before, the relationships between the supply chain practices and the measures of firm performance have been widely studied. Töyli et al. (2008) present a three layer research framework describing the linkages between supply chain practices and performance, including a layer of “logistics profile elements”, which in this research are referred as “supply chain practices”, a layer of “logistics performance” which in this research are considered as “intra-firm supply chain performance (Lorentz et al., 2012).

Duran and Yavuz (2015) carried a study on the impact of the supply chain strategies and the competitive strategies on the firm performance and if this changes according to the conditions of uncertainty. The study involved manufacturing companies listed in Borsa Istanbul in Turkey was utilized. After the pilot test, questionnaires were applied to 174 companies listed in Borsa Istanbul via e-mail and telephone, whereas 90 companies responded. The study was found out that; the competitive strategies influenced the supply chain strategies positively and significantly; cost leadership strategy and lean supply chain strategy had a significant impact on the firm performance under the conditions of high uncertainty; whereas, differentiation strategy and agile supply chain strategy had a significant impact on the firm performance under the low uncertainty.

Sharif (2011) carried out a study on factors influencing the strength of the relationship between performance management and performance outcomes among Kenyan oil companies. Using a descriptive survey design, the study revealed that the existence of a strong relationship between performance management and performance outcomes. However, there were other moderating factors that were also discovered to affect the strength of this relationship, other than performance management itself. However, there were other moderating factors that were also discovered to affect the strength of this relationship, other than performance management itself.

Rao et al. (2004) carried out a study on the impact of supply chain management practices on competitive advantage and organizational performance in the US. Data for the study were collected from 196 organizations and the relationships proposed in the framework were tested using structural equation modeling. The study focused on five dimensions of SCM practice (strategic supplier partnership, customer relationship, level of information

sharing, quality of information sharing, and postponement) and tests the relationships between SCM practices, competitive advantage, and organizational performance. The findings of their study indicated that higher levels of SCM practice can lead to enhanced competitive advantage and improved organizational performance. Also, competitive advantage can have a direct, positive impact on organizational performance.

Ralston (2013) carried out an online survey on the structure–conduct–performance perspective of how strategic supply chain integration affects firm performance in Florida. In total, the research team attempted to contact 4,456 supply chain professionals from late 2010 through early 2011. His findings establish a framework from industrial organizational economics and develop and empirically tested the theory about how a firm's supply chain integration activities impact firm performance. He examined how the firm can use its supply chain integration activities as a structural response to competitive market conditions to enhance firm performance. Wallenburg (2009) and Brewer, Ashenbaum and Ogden (2013) have recently analyzed the effect of logistics outsourcing on firm performance, both concluding that the motives, and thus the focus, of outsourcing is crucial to the performance outcomes.

Both Wallenburg (2009) and Brewer et al. (2013) argue that cost-driven outsourcing is dominant from the performance perspective. Wallenburg takes the idea further, suggesting that also more strategic motives for outsourcing could be beneficial on a long term basis. Kamya, Ntayi, and Ahiauzu (2010) in their study on the impact of supply chain collaboration on SMEs in turkey found out that; that the market performance of knowledge organizations is expected to be superior to that of traditional enterprises. Hern´andez-Espallardo et al. (2010) indicated that inter-firm learning improves a crucial

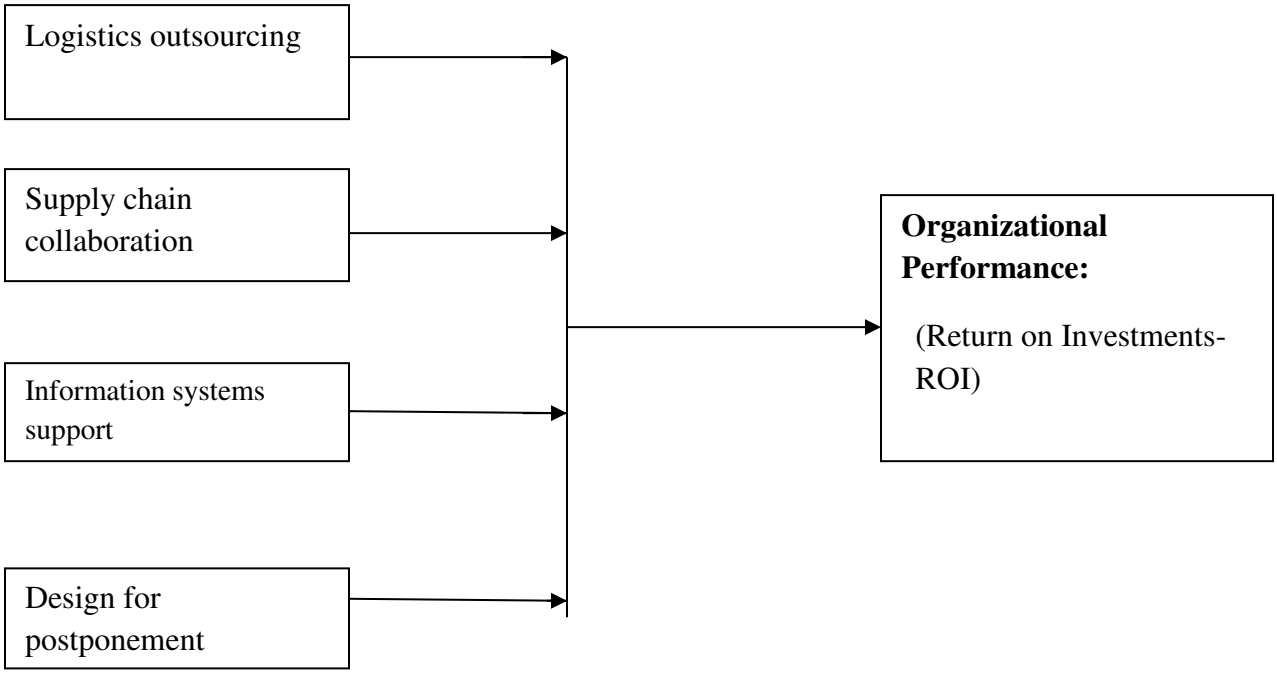
mechanism that facilitates coordination and supply chain performance. This finding is echoed by other researchers, who acknowledge that knowledge sharing and learning have a positive influence on supply chains' performance. According to their study, supply chain management strategy, organizational learning, supply chain innovation, trust, commitment, and collaboration have been found to play mediating roles in the relationship between market orientation and supply chain performance.

2.6 Conceptual frame work

A conceptual framework is a logically developed, described and elaborated network of interrelationships among variables integral in the dynamics of a situation being investigated (Mertens, 1998). It explains the theory underlying these relationships and describes the nature and direction of these relationships. A variable is a measurable characteristic that assumes different values among the subject. It is therefore a logical way of expressing a particular attribute in a subject (Mugenda and Mugenda, 2003).

A dependent variable is the variable of primary interest to the researcher. In the current study the dependent variable will be the organizational performance of the respective cement companies. An independent variable is the one that influences the dependent variable in either a positive or negative way. The independent variables in this study will include: logistics outsourcing, supply chain collaboration, information systems support, and design for postponement.

Figure 2: The Conceptual Framework



2.7 Summary of Literature Review

Relevant literature is reviewed and synthesized first to develop a theoretical and conceptual model. The ensuing research is based on a summary of the literature thus presented. Much of the review considers empirical works published in academic journals from 1990 to 2015. The review started by looking at the concept of supply chain management. The chapter then moves into the theoretical frame work of the study. Key theories discussed in this section include; Collaborative' paradigm theory, Purchasing portfolio theory and Manufacturing Strategy Theory. The chapter then delves into reviewing literature on the link between supply chain management practices and organizational performance. The chapter then moved on to review past empirical and theoretical outcomes on the supply chain management practices and their effect on organizational performance. The main variable discussed here includes; logistics

outsourcing, supply chain collaboration, information support systems and design for postponement.

Over the literature of reviewing and consolidating that has been pointed out by different researchers, academicians and consultant, there are seven distinctive dimensions of SCM practices which are widely agreed by researchers and received the most consensuses in the researches. These seven dimensions are outsourcing, strategic supplier partnerships, customer relationships, information sharing, postponement, quality of information sharing and lean practices. Many previous researches explored the importance of integrating suppliers, manufacturers, and customers or supply chain integration and Westbrook, i.e. supply chain management so as to obtain flexibility and speed.

By addressing supply chain management practices that contribute to organizational performance, the literature review helped the researcher better understand the scope and activities related to supply chain management that create enhanced level of supply chain responsiveness in competitive business marketplace. The purpose of the review was to critically review literature on the effect of supply chain management practices such as strategic supplier partnership, customer relationship, information sharing and supply chain responsiveness on the overall organization performance of cement firms in Kenya.

Additionally, the literature review also covered the effect of supply chain responsiveness in term of operation system responsiveness, logistic process responsiveness, supplier network responsiveness and competitive advantage of the firm. The chapter ends with a conceptual framework indicating a logically developed, described and elaborated network of interrelationships among variables integral in the dynamics of a situation being

investigated. It explains the theory underlying these relationships and describes the nature and direction of these relationships.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on; the research design, population, sampling frame and sample size, data collection methods, and data analysis methods that were used in the study.

3.2 Research Design

The study adopted a cross-sectional design. The rationale for using a cross-sectional design is based on the fact that, Cross sectional studies are generally quick, easy, and cheap to perform. They are often based on a questionnaire survey. In addition, there will be no loss to follow-up because participants are interviewed only once. However, a cross sectional study may be prone to non-response bias if participants who consent to take part in the study differ from those who do not, resulting in a sample that is not representative of the population (Kothari, 2011).

A 5-point Likert scale was used to measure the output of each item answered by the participants on the predictor variables (various supply chain management practices). Based on secondary data, the variable of organizational performance was measured using the Return on Investments (ROI) metric.

3.3 Population framework

The population of interest in the current study consisted of all the six cement companies operating in Kenya (see appendix I). A census sampling approach was adopted, and thus the sampling frame consisted of all the cement firms operating in Kenya. The study adopted a census approach because of the small number of cement companies operating

in Kenya. According to Saunders, Lewis & Thornhill (2009), a census approach enhances validity of the collected data by including certain information-rich cases for study.

3.4 Data Collection

Both primary and secondary data was utilized in the study. According to Kothari (2011) primary data are those which are collected afresh and for the first time, and thus happen to be original in character. Primary data was collected using a semi-structured questionnaire subdivided into two parts. Part 1 consisted of open-ended questions aimed at obtaining general information on the cement companies while Part 2 consisted of questions aimed at obtaining data on supply chain management practices and organizational performance. The study was conducted by the researcher himself. The respondents in the study were the supply chain managers of the cement firms owing to the fact that in most cases supply chain design strategy fall in the domain of supply chain strategic managers in most companies. Secondary data was obtained from the annual financial reports of the respective companies; the Nairobi stocks exchange data base and ministerial reports on the cement industry.

3.6 Data Analysis

Both descriptive and inferential statistics were used to describe (and analyse) the variables numerically. These included: simple means; standard deviations regression and correlation analysis by use of SPSS while factor analysis was applied to check on the categorization of the supply chain practices banking practices adopted by cement companies in Kenya. A multivariate regression model was used to analyse the relationship between supply chain management practices and organizational performance.

Snijders & Bosker (2000) outline the rationale for multivariate regression analysis based on the following salient features: The fact that conclusions can be drawn about the correlations between the dependent variables, notably, the extent to which the correlations depend on the individual and on the group level. Such conclusions follow from the partitioning of the covariance's between the dependent variables over the levels of analysis; and the fact that, the tests of specific effects for single dependent variables are more powerful in the multivariate analysis. The multiple regression model was computed as follows; $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7$

Where;

Y = Organizational performance (ROA)

β_0= Constant

$\beta_1, \beta_2, \beta_3, \beta_4,$ = Coefficients of determination

X_1= Increase in operational flexibility

X_2 = The company performs end of line configuration & late point differentiation /delayed product differentiation

X_3= The company is able to share the design of process collaboratively

X_4= The company applies Standard procedures geared towards process integration in the supply chain

X_5 = Optimal level of outsourcing through cost reduction

X_6= Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI)

X_7= Cost-driven outsourcing through cost reduction

CHAPTER FOUR: DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

This chapter presents the findings of the study in establishing the effect of supply chain management practices on the performance of cement companies in Kenya which was based on the following specific objective: to establish the relationship between supply chain management practices and performance of cement companies in Kenya. With the help of SPSS version 21 statistical software, data on supply chain management practices adopted and their impact on the on the procurement performance of the respective cement firms was analysed using; mean scores, standard deviations, coefficients of variation and regression analysis. The factors were ranked in order of importance, the correlation between them yielded the key factors that loaded most on the components and therefore had the greatest impact on procurement performance of th cement companies. Six (6) questionnaires were administered to the cement companies. All the questionnaires were returned representing a response rate of 100%. This response rate was sufficient and representative and conforms to Mugenda and Mugenda (2003) stipulation that a response rate of 50% is adequate for analysis and reporting; a rate of 60% is good while a response rate of 70% and over is excellent.

4.2 Demographic Information

The demographic characteristics of the respondents that were tested include position and the existence of a supply chain management system/framework.

4.2.1 The position of the respondents

The study sought to determine the positions of the respondents in their respective firms. The results are shown in Table 4.1 below;

Table 4.1 Position of the respondents

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	supply chain manager	4	66.7	66.7	66.7
	operations manager	2	33.3	33.3	100.0
	Total	6	100.0	100.0	

Source: Researcher (2015).

From Table 4.1 it is clear that most of the respondents (66.7%) were from supply chain management. This implies that the respondents are directly involved in making key decisions in supply chain strategy and strategic planning in the respective cement firms, thus were better placed and aware of changes which had taken place in their institution and supplier selection practices adopted.

4.2.2 Existence of a Supply chain Management System

The impact of a supply chain management policy depends on the supply chain framework adopted by the respective supply chain partners. The study sought to determine the number of cement firms that have established a supply chain framework. The results are shown in Table 4.2 below;

Table 4.2 Existence of a supply chain management system

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	yes	5	83.3	83.3	83.3
	No	1	16.7	16.7	100.0
	Total	6	100.0	100.0	

Source: Researcher (2015).

From Table 4.2 above, 83.3 percent of the cement companies in Kenya have established a supply chain management framework. This indicates that most firms have appreciated the role of supply chain management as a major strategy of building their core competences.

4.3 Supply chain management practices adopted by cement companies in Kenya

Unlike the classical functional approach, supplier chain management is process oriented. The effectiveness of a supply chain management process lays in the implementation of specific supply chain management practices in the context of a given supply chain policy. Towards this end, the study sought to examine the various supply chain management practices adopted the cement firms in Kenya. The respondents were asked questions on the extent to which their companies have adopted various supply chain management practices on a likert scale of 1-5 where: 1 = No extent; 2= Small extent; 3= Moderate extent; 4= Large extent; and 5= Very Large extent**.**

In the initial step, a correlation matrix was generated to identify any significant relation between the items then Descriptive statistics were used to determine the variance of the supply chain management practices as shown in Table 4.3.

Table 4.3 Supply chain management practices

	Mean	Std. Deviation
Focusing on core competencies	4.3333	.81650
Cost-driven outsourcing through cost reduction	2.6667	1.03280
improvement of service levels	4.0000	1.09545
increase in operational flexibility	3.6667	.51640
improvement of asset utilization	1.6667	.81650
Optimal level of outsourcing through cost reduction	4.33333	.816497
Change management	2.1667	.75277
The company maintains Cooperation and effective communication mechanisms	2.8333	.75277
The company undertakes Information sharing among the members of the supply chain	1.5000	.54772
The company is engaged Sharing of technical expertise.	2.3333	.81650
The company has formed transaction - specific resources investment to foster relational governance bond	2.3333	1.50555
The company applies Standard procedures geared towards process integration in the supply chain	2.6667	.51640

The company maintains Cooperation and effective communication mechanisms	3.1667	1.16905
The company is able to share the design of process collaboratively	2.5000	.54772
The company is able to collaboratively share Open book costing	1.3333	.51640
The company is able to interchange staff in joint Projects	2.6667	1.96638
The company is able to undertake joint projects	2.1667	.75277
The company is able to undertake collaborative planning	2.6667	1.50555
The company is able to share the design of process collaboratively	3.1667	1.16905
The company applies current inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI).	3.5000	1.37840
The company combines Decision Support Systems (DSS) with VIM.	2.1667	.75277
The company acquires and maintains appropriate resources like; IT, training etc.	3.5000	1.04881
The company has adopted Vendor-managed inventory (VMI) systems among other current technologies.	2.3333	.81650
Top management support for research and innovation and investments in current technology.	2.6667	1.63299
Investment in complementary assets including; ICT training, hard and software infrastructure establishments.	1.6667	.51640
Advances in on-line information systems.	1.5000	.54772
Corporate cultural orientation towards ICT and innovation	3.1667	1.16905
The company performs end of line configuration & late point differentiation /delayed product differentiation.	3.8333	1.32916
The company undertakes robust demand forecasting and planning.	2.3333	1.21106
The company has an optimal inventory policy.	5.0000	.00000
The company adopts a process standardization model where all products follow a series of common steps, after the completion of which products are differentiated.	3.8333	.75277
The company's supply chain function leads to reduction of finished goods inventory.	3.3333	.51640
The supply chain design process is geared towards declined safety stock.	3.6667	.81650

Source: Researcher (2015).

According to the findings in Table 4.3 the company's establishment of an optimal inventory policy has the highest mean at 5.0 and standard deviation of 0.0000 implying that most cement companies in Kenya have adopted this supply chain management practice to a very large extent. The standard deviation of (0.0000) shows that the responses did not deviate at all from the mean. Optimal level of outsourcing through cost

reduction and Focusing on core competencies is adopted to a large extent each with a mean of 4.3333and standard deviation of 0.33333 implying that the respondents were not polarized and seemed to have concentrated around the mean. The company undertakes Information sharing among the members of the supply chain has the lowest mean at 1.5 and standard deviation of 0.2236 implying that most cement firms have adopted this supply chain practice to a very small extent. The standard deviation of 0 .22361 implies that the responses were slightly scattered around the mean. The overall mean was 2.9583 implying that in general, the cement firms have adopted supply chain practices to a moderate extent based on the likert scale. The overall standard error is 0.384025 indicating that the individual data values are not far from the mean values. This implies that the sample mean is close to the true mean of the overall population.

For easy analyzability the data was reduced by Principal Component Analysis. Before factor extraction, there were thirty-four eigenvectors which corresponded to the number of supply chain management practices adopted by the cement companies in Kenya. Seven principal components were extracted for supply chain management practices. Observation indicated that the seven decision factors accounted for 84.55 % of the total variation (see appendix IV). Seven supply chain management practices account for up to 84.55% of the total standard variances implying that indicate the seven supply chain management practices that have the greatest impact on the organizational performance of cement firms in Nairobi. These supply chain management practices are: Cost-driven outsourcing through cost reduction; increase in operational flexibility; The company applies Standard procedures geared towards process integration in the supply chain; Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI); Optimal level of outsourcing through cost reduction;

The company is able to share the design of process collaboratively; and The company performs end of line configuration & late point differentiation /delayed product differentiation.

According to the Component Transformation Matrix, Cost-driven outsourcing through cost reduction is having the greatest influence on the procurement performance of the cement companies in Kenya since it accounts for up to 35.907% of the variation in organizational performance of cement companies in Kenya followed by the company's application of Standard procedures geared towards process integration in the supply chain (at 20.728%). Increase in operational flexibility and Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI) follow at 9.738% and 7.087% respectively. The fifth most influential supply chain management practice is the Company's performance of end of line configuration & late point differentiation /delayed product differentiation accounting for 4.094%. Optimal level of outsourcing through cost reduction accounts for 3.676% of the variation in the organizational performance of cement firms in Kenya. The company's is ability to share the design of process collaboratively has the least influence on the variation of the accounting for 3.320% of the total variation in the organizational performance of cement firms in Kenya.

4.4 Establishing the relationship between Supply chain management and Organizational Performance

A multiple regression model was used to establish the relationship between supply chain management practices (predictor variables) and Organizational performance (dependent variable). Using SPSS version 21 package, the resulting regression coefficients have been used to interpret the direction and magnitude of the relationship. The βeta coefficients

show the responsiveness of the dependent variable as a result of unit change in each of the independent variables (supplier selection practices). The error term ε captures the variations that cannot be explained by the model. Organizational performance (dependent variable) was measured by the return on Assets (ROA) metric. The results are shown in Table 4.4 below;

Table 4.4 Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
1	.896[a]	.803	.165	1.46437	.803	2.893	7	7	.001	1.314

Source: Researcher (2015).

a. Predictors: (Constant), Cost-driven outsourcing through cost reduction; increase in operational flexibility; The company applies Standard procedures geared towards process integration in the supply chain; Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI); Optimal level of outsourcing through cost reduction; The company is able to share the design of process collaboratively; and The company performs end of line configuration & late point differentiation /delayed product differentiation.

b. Dependent Variable: Organizational performance (ROA

From Table 4.4 above, the Coefficient of Multiple Determination (R^2 Square) is 0.803 implying that that the regression line is of "*High goodness of fit"* explaining up to 80.3% of the variation in Organizational performance of the cement companies in Kenya.

Table 4.5 ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	20.937	7	2.991	2.893	.001[a]
	Residual	15.011	7	2.144		
	Total	35.948	14			

Source: Researcher (2015).

a. Predictors: (Constant), Cost-driven outsourcing through cost reduction; increase in operational flexibility; The company applies Standard procedures geared towards process integration in the supply chain; Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI); Optimal level of outsourcing through cost reduction; The company is able to share the design of process collaboratively; and The company performs end of line configuration & late point differentiation /delayed product differentiation.

b. Dependent Variable: Organizational performance (ROA)

Table 4.5 above indicted that the F static was 2.893 with a significant change of 0.001%. Since the p-value is less that the critical value ($p \leq 0.05$) we can confidently infer that; the impact of supply chain management on organizational performance is significant at 5% confidence level.

Table 4.6 Regression Model coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B		Correlations		
		B	Std. Error	Beta			Lower Bound	Upper Bound	Zero-order	Partial	Part
1	(Constant)	1.274	3.182		1.215	.006	-3.657	11.393			
	increase in operational flexibility	.783	.501	.225	-.612	.002	-1.492	.878	-.279	-.225	-.150
	The company performs end of line configuration & late point differentiation /delayed product differentiation	.608	.586	.809	1.869	.003	-.291	2.483	.255	.577	.457
	The company is able to share the design of process collaboratively	.167	.053	.327	1.226	.006	-.060	.189	.289	.421	.300
	The company applies Standard procedures geared towards process integration in the supply chain	.846	.425	.498	1.423	.001	-.400	1.609	-.056	.474	.348
	Optimal level of outsourcing through cost reduction	.318	.553	.073	.213	.045	-1.191	1.426	.379	.080	.052
	Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI)	.766	.437	.610	.746	.003	-1.798	.271	-.143	-.551	-.426
	Cost-driven outsourcing through cost reduction	.903	.555	.482	1.459	.001	-2.121	.502	-.263	-.483	-.356

Source: Researcher (2015)

The results in Table 4.6 above show that all the seven supply chain management practices had a positive effect on the organizational performance of the cement firms in Kenya.

The most influential supply chain management practice is Cost-driven outsourcing through cost reduction with a regression coefficient of 0.903 and a p- value of 0.001. The company applies Standard procedures geared towards process integration in the supply chain is the next most influential supply chain management practice with a regression coefficient of 0.846 and p-value of 0.001. Increase in operational flexibility and Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI) follow at 0.783 and 0.766 with 0.002 and 0.003 p-values respectively. The fifth most influential supply chain management practice on the variation of the organizational performance of cement firms in Kenya is the Company's performance of end of line configuration & late point differentiation /delayed product differentiation with a regression coefficient of 0.608 and p-value of 0.003 followed by Optimal level of outsourcing through cost reduction at 0.318 and 0.045 respectively. The least influential supply chain management practice is the Company's is ability to share the design of process collaboratively with a regression coefficient of 0.167 and p-value of 0.006.

As per the SPSS generated results shown in Table 4.8 the Equation $Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \beta_7X_7$ becomes;

$$\mathbf{Y = 1.274 + 0.783X_1 + 0.608X_2 + 0.167X_3 + 0.846X_4 + 0.318X_5 + 0.766X_6 + 0.903X_7}$$

Where;

Y = Organizational performance (ROA)

β_0= Constant

$\beta_1, \beta_2, \beta_3, \beta_4,$ = Coefficients of determination

X_1= Increase in operational flexibility

X_2 = The company performs end of line configuration & late point differentiation /delayed product differentiation

X_3= The company is able to share the design of process collaboratively

X_4= The company applies Standard procedures geared towards process integration in the supply chain

X_5 = Optimal level of outsourcing through cost reduction

X_6= Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI)

X_7= Cost-driven outsourcing through cost reduction

According to the regression equation established above, taking all the independent variables at zero, the Organizational performance of the cement firms in Kenya will be will be 1.274. The data findings analyzed also shows that holding all other independent variables constant, a unit increase in operational flexibility will lead to a 0.783 in the organizational performance of the cement firms in Kenya. The regression line also indicates that, a unit increase in in the company performing end of line configuration & late point differentiation/delayed product differentiation will lead to a 0.608 in the organizational performance of the cement firms in Kenya. Keeping all other variables constant, a unit increase in the company's ability to share the design of process collaboratively will lead to an increase of 0.167 in the organizational performance of the cement firms in Kenya. On the other hand, taking all other independent variable constant, a unit increase in the company's application of Standard procedures geared towards

process integration in the supply chain will lead to a 0.846 increase in the organizational performance of the cement firms in Kenya. Equally, holding all other variable constant, a unit increase in the optimal level of outsourcing through cost reduction will lead to a 0.318 increase in the organizational performance of the cement firms in Kenya. Taking all other variables constant, a unit increase in Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI) will lead to a 0.766 increase in the organizational performance of the cement firms in Kenya. Finally, a unit increase in the Cost-driven outsourcing through cost reduction will lead to a 0.903 increase in the organizational performance of the cement firms in Kenya. The results above show that Supply chain management practices have had a significant influence on the organizational performance of the cement firms in Kenya during the period under study.

4.5 Discussion of the results

The main objective of the study was to establish the relationship between supply chain management practices and performance of cement companies in Kenya. The study findings above have outlined the extent to which the various supply chain practices affect the performance of cement firms in Kenya. This is supported by the high Coefficient of Multiple Determination (R^2) of 0.803 and significance change of 0.001 (refer to Table 4.4: Model Summary). According to the findings above, the following supply chain management practices have the biggest impact on the organizational performance of cement companies in Kenya: Cost-driven outsourcing through cost reduction; increase in operational flexibility; The company applies Standard procedures geared towards process integration in the supply chain; Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI); Optimal level of

outsourcing through cost reduction; The company is able to share the design of process collaboratively; and The company performs end of line configuration & late point differentiation /delayed product differentiation.

Given the fact that most of the most studies past studies fail to give a direct analysis of the relationships between supply chain practices and financial performance, the findings of this study fill this gap by establish the relationship between supply chain management practices and performance among cement companies in Kenya. The findings thus adequately address the research question: what is the relationship between supply chain management practices and performance of cement companies in Kenya?

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The study sought to investigate supply chain management practices and performance of cement companies in Kenya. This chapter presents; the summary of the findings, conclusions and recommendations of the study.

5.2 Summary of the Findings

The objective of the study was to establish the relationship between supply chain management practices and performance of cement companies in Kenya. The outcome of the study revealed that 83.3 percent of the cement companies in Kenya have established a supply chain management framework. This indicates that most firms have realized the centrality of supply chain management. According to the study findings, over 60% of the cement firms at least have adopted supply chain management practices to some extent with a mean over 2.5. The company establishment of an optimal inventory policy has been adopted to the largest extent with the highest mean of 5.0 while the company's undertaking in information sharing among the members of the supply chain has been cement firms have adopted this supply chain practice to the smallest extent.

According to the outcome of the Principal Component Analysis, seven principal components were extracted for supply chain management. Observation indicated that the seven supplier selection practices account for 84.55% of the total standard variances implying that indicate the seven supply chain management practices have the greatest impact on the organizational performance of cement companies in Kenya. These supply chain management practices are: Cost-driven outsourcing through cost reduction;

increase in operational flexibility; The company applies Standard procedures geared towards process integration in the supply chain; Inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI); Optimal level of outsourcing through cost reduction; The company is able to share the design of process collaboratively; and The company performs end of line configuration & late point differentiation /delayed product differentiation.

The study findings also indicate that; Cost-driven outsourcing through cost reduction is having the greatest influence on the procurement performance of the cement companies in Kenya since it accounts for up to 35.907% of the variation in organizational performance of cement companies in Kenya followed by the company's application of Standard procedures geared towards process integration in the supply chain (at 20.728%). On the other hand, the Company's is ability to share the design of process collaboratively has the least influence on the variation of the accounting for 3.320% of the total variation in the organizational performance of cement firms in Kenya.

5.3 Conclusion

In sum, the regression outcome indicates that supplier selection practices have had significant influence on the procurement performance of cement firms in Kenya in during the period under study. The outcome of the study establishes a near perfect positive relationship between supply chain management practices and the organizational performance of the cement firms in Kenya with the regression analysis yielding Coefficient of Multiple Determination (R^2) of 0.803 implying that up to 80.3% of the variation in the organizational performance of the cement firms in Kenya can be attributed to the supply chain management practices they have adopted over time. The p-

value of 0.001 indicates that there impact of supply chain management practices on the organizational performance of cement firms in Kenya is significant at 95% confidence level.

5.4 Recommendations to Policy and Practice

The study found that up to 16.7% percent of the cement firms in Kenya are yet to establish a supply chain management framework underscoring the need for the management of these cement companies to consider establishing a supply chain management framework to enhance their competitiveness.

According to the study over 60% of the companies have adopted most supply chain practices to a small extent implying that even in cement firms where a supply chain management framework exist, the utilization of the system is still very low. This call for the management of the firms to establish critical success factors for the adoption and implementation of best practice supply chain management practices among the cement firms. The fact that most of the supply chain management practices have a near perfect positive influence on organizational performance underscores the need for the organizations not only in the cement industry bust across other sectors to increase investment in current supply chain management and improvement to build their core competences. The findings of this study further underpins the need for firms in Kenya to foster collaborative private and public research designing the scope and functionality of a supply chain management framework specifically tailored to the Kenyan macro-environment to enhance supply chain and overall organizational performance.

5.5 Limitations of the Study

The study sought to establish the relationship supply chain management practices and organizational performance. It is clear that a study of this magnitude should include a survey of sizeable number of firms. However time and material resources did not make this feasible and for this reason the study concentrated on the six companies in Kenya.

On the other hand, the study period was a little bit narrow for a study of this nature. The researcher had to juggle between work and the field particularly during data collection. This was a major hindrance particularly in ensuring that the research work did not hamper the performance and productivity of the researcher at the work place. At the same time, some of the respondents were non-committal posing major challenge in the field during the data collection costing the researcher since he had to do a lot of data editing after field work. Despite these challenges the validity of the findings emanating from this study cannot be compromised.

5.6 Suggestions for further Research

Studies involving confirmatory factor analysis will need to be carried out to further test the model so established and to confirm the findings of the study. Further studies can be conducted to test and confirm the factor loadings in different industrial firms so as to establish the validity and strength of the model. In the same context, there is need for further research to focus on the critical success factors in the adoption of best practice supply chain management models.

The fact that the degree to which various supply chain management practices affects organizational performance varies from one firm to the other calls for further research efforts to identify optimal supply chain management practices and on the possibility of

setting benchmarks in Kenya. The need for further research into this aspect of supply chain management is further compounded by the facts that supply chain management is a relatively new phenomenon in Kenya.

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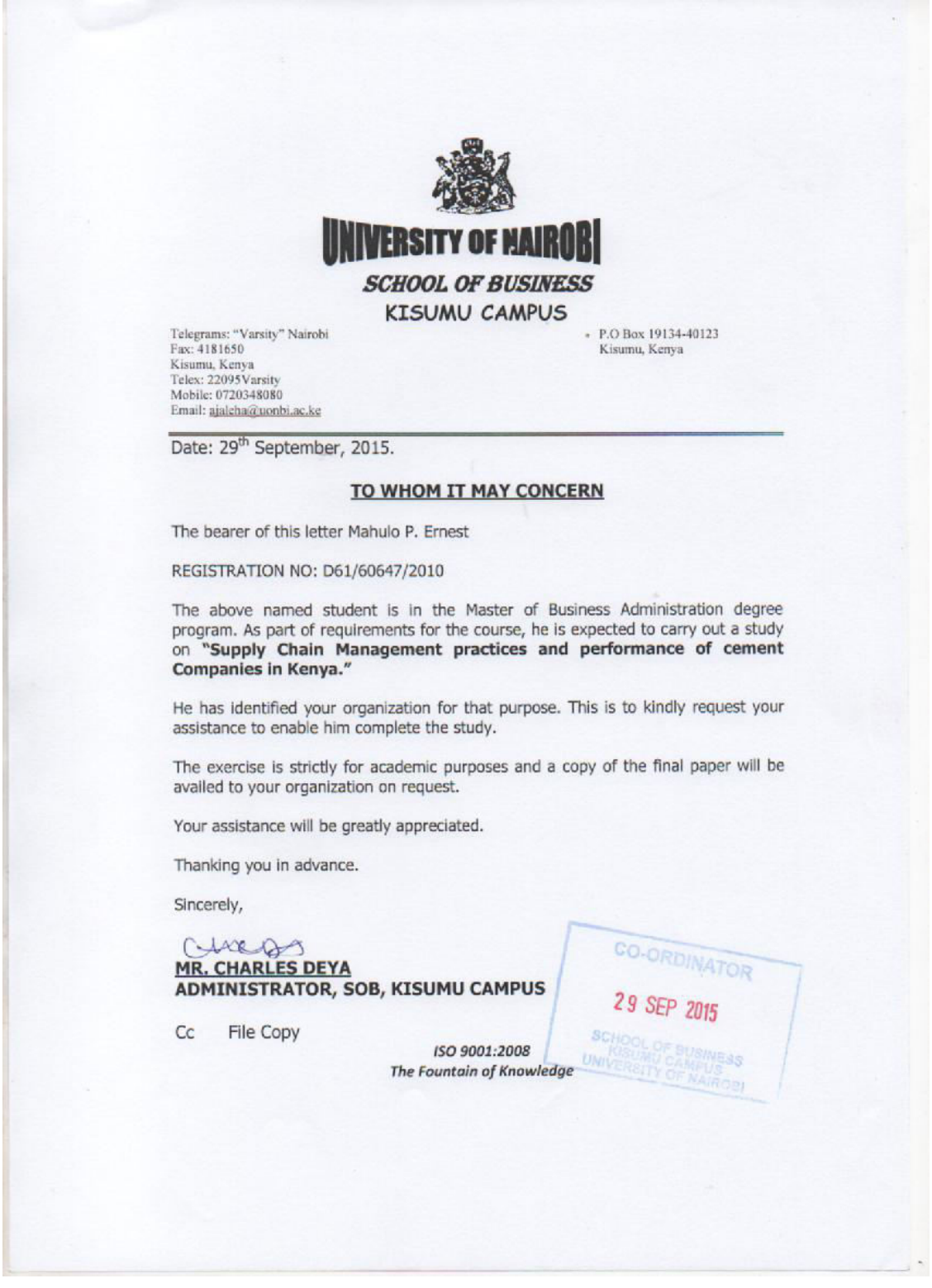
APPENDICES

APPENDIX I: LETTER OF INTRODUCTION



UNIVERSITY OF NAIROBI

SCHOOL OF BUSINESS

KISUMU CAMPUS

Telegrams: "Varsity" Nairobi
Fax: 4181650
Kisumu, Kenya
Telex: 22095Varsity
Mobile: 0720348080
Email: ajaleha@uonbi.ac.ke

P.O Box 19134-40123
Kisumu, Kenya

Date: 29th September, 2015.

TO WHOM IT MAY CONCERN

The bearer of this letter Mahulo P. Ernest

REGISTRATION NO: D61/60647/2010

The above named student is in the Master of Business Administration degree program. As part of requirements for the course, he is expected to carry out a study on **"Supply Chain Management practices and performance of cement Companies in Kenya."**

He has identified your organization for that purpose. This is to kindly request your assistance to enable him complete the study.

The exercise is strictly for academic purposes and a copy of the final paper will be availed to your organization on request.

Your assistance will be greatly appreciated.

Thanking you in advance.

Sincerely,

MR. CHARLES DEYA
ADMINISTRATOR, SOB, KISUMU CAMPUS

Cc File Copy

CO-ORDINATOR
29 SEP 2015
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APPENDIX II: THE QUESTIONNAIRE

PART A: GENERAL INFORMATION

i. Name of your company? ……..…….…… …. (Optional)

ii. Your position in the company?……..…….....(Optional)

PART B: SUPPLY CHAIN MANAGEMENT PRACTICES

I. Has your company a supply chain management system?

Yes ☐ No ☐

Please tick where appropriate

II. To what extent has your company adopted the following supply chain management practices?

Please indicate on a Scale of 1 – 5 where: 1 = No Extent; 2 = Small extent; 3 = Moderate Extent; 4 = Large Extent; 5 = Very Large Extent

No	SUPPLY CHAIN PRACTICES ASSOCIATED WITH FIRM PERFORMANCE	(1)	(2)	(3)	(4)	(5)
	A. Logistics outsourcing					
i.	focusing on core competencies					

ii.	Cost-driven outsourcing through cost reduction					
iii.	improvement of service levels					
iv.	increase in operational flexibility					
v.	improvement of asset utilization					
vi.	Optimal level of outsourcing through cost reduction					
vii.	change management					
	B. Supply chain collaboration					
viii.	The company maintains Cooperation and effective communication mechanisms					
ix.	The company undertakes Information sharing among the members of the supply chain					
x.	The company is engaged Sharing of technical expertise.					
xi.	The company has formed transaction - specific resources investment to foster relational governance bond					
xii.	The company applies Standard procedures geared towards process integration in the supply chain					
xiii.	The company maintains Cooperation and effective communication mechanisms					
xiv.	The company is able to share the design of process collaboratively					
xv.	The company is able to collaboratively share Open book					

	costing					
xvi.	The company is able to interchange staff in joint Projects					
xvii.	The company is able to undertake joint projects					
xviii.	The company is able to undertake collaborative planning					
xix.	The company is able to share the design of process collaboratively					
	C. Information System support					
xx.	The company applies current inventory management technologies like, Vendor Managed Inventory (VIM) and Electronic data interchange (EDI).					
xxi.	The company combines Decision Support Systems (DSS) with VIM.					
xxii.	The company acquires and maintains appropriate resources like; IT, training etc.					
xxiii.	**The company has adopted Vendor-managed inventory (VMI) systems among other current technologies.**					
xxiv.	Top management support for research and innovation and investments in current technology.					
xxv.	Investment in complementary assets including; ICT training, hard and software infrastructure establishments.					
xxvi.	Advances in on-line information systems.					
xvii.	Corporate cultural orientation towards ICT and innovation					

l	**D. Design for postponement**					
xviii.	The company performs end of line configuration & late point differentiation /delayed product differentiation.					
xxix.	The company undertakes robust demand forecasting and planning.					
xxx.	The company has an optimal inventory policy.					
xxxi.	The company adopts a process standardization model where all products follow a series of common steps, after the completion of which products are differentiated.					
xxii.	The company's supply chain function leads to reduction of finished goods inventory.					
xxiii.	The supply chain design process is geared towards declined safety stock.					

PART C: SUPPLY CHAIN MANAGEMENT PRACTICES AND ORGANIZATIONAL PERFORMANCE

III. Please provide us with the following information regarding your company's overall performance over in the last five years?

		2010	**2011**	**2012**	**2013**	**2014**
	Return on Assets (ROA)					
	Resource utilization %					
i	Transaction Cost reduction %					

THANK YOU VERY MUCH FOR YOUR VALUABLE TIME!!

APPENDIX III: LIST OF CEMENT COMPANIES IN KENYA

	Company	Brand
1	Bamburi Cement Limited	Nguvu cement
2	Athi River Mining company (ARM)	Rhino cement
3	East African Portland Cement Company Limited (EAPC)	Blue triangle cement
4	National Cement Company Limited (NCC)	Simba cement
5	Mombasa Cement Limited (MCL)	Nyumba cement
6	Savannah Cement Company (SCC)	Savannah cement

Source: Researcher (2015).

APPENDIX IV: TOTAL VARIANCE EXPLAINED

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	12.208	35.907	35.907	12.208	35.907	35.907
2	7.047	20.728	56.635	7.047	20.728	56.635
3	3.311	9.738	66.373	3.311	9.738	66.373
4	2.410	7.087	73.460	2.410	7.087	73.460
5	1.392	4.094	77.554	1.392	4.094	77.554
6	1.250	3.676	81.230	1.250	3.676	81.230
7	1.129	3.320	84.550	1.129	3.320	84.550
8	.927	2.726	87.277			
9	.755	2.220	89.497			
10	.618	1.818	91.315			
11	.552	1.625	92.940			
12	.444	1.305	94.245			
13	.366	1.077	95.322			
14	.343	1.009	96.331			
15	.327	.963	97.294			
16	.203	.598	97.892			
17	.160	.472	98.363			
18	.137	.403	98.766			
19	.096	.282	99.048			
20	.072	.212	99.260			
21	.061	.179	99.439			

22	.049	.143	99.582			
23	.041	.121	99.704			
24	.028	.081	99.785			
25	.024	.071	99.855			
26	.020	.058	99.914			
27	.012	.034	99.948			
28	.007	.020	99.968			
29	.005	.014	99.982			
30	.004	.011	99.993			
31	.002	.006	99.999			
32	.000	.001	100.000			
33	7.153E-5	.000	100.000			
34	9.746E-6	2.867E-5	100.000			

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 9 iterations.

Source: Researcher (2015)

Table 4.5 Component Transformation Matrix

Component	1	2	3	4	5	6	7
1	.919	.284	-.127	.101	.024	-.180	-.123
2	-.317	.906	-.140	.112	-.212	-.038	-.034
3	.025	.262	.767	.032	.577	.089	.010
4	.078	.131	-.041	-.875	-.008	.346	-.301
5	.045	.048	-.431	.278	.418	.737	.119
6	.206	.009	.406	.082	-.640	.499	.356
7	.054	.107	-.154	-.357	.191	-.215	.867

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.