

**SUPPLY CHAIN DETERMINANTS OF
ORGANIZATIONAL PERFORMANCE AMONG
TEXTILE MANUFACTURING FIRMS IN KENYA:THE
MODERATING EFFECT OF BACKGROUND
CHARACTERISTICS**

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Moderating Effect of Background Characteristics**

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DECLARATION

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

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DEDICATION

To my family for their love, support, encouragement and prayers which contributed to success of the entire study.

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LIST OF ABBREVIATIONS AND ACRONYMS

ANOVA	Analysis of Variance
CRM	Customer Relationship Management
CSCMP	Council of Supply Chain Management Professionals
EABL	East African Breweries Limited
EDI	Electronic Data Interchange
EDRMS	Electronic Document and Recording Management System
EFT	Electronic Fund Transfer
ELDOWAS	Eldoret Water and Sewerage
EOQ	Economic Order Quantity
EPOS	Electronic Point of Sale
EPZ	Export Processing Zone
ERP	Enterprise Resource Planning
GDP	Gross Domestic Product
HOD	Head of Department
ICT	Information Communication Technology

IFMIS	Integrated Financial Management Information System
IT	Information Technology
JIT	Just In Time
KTMA	Kenya Textile Manufacturers Association
M	Mean
MOIED	Ministry of Industrialization and Enterprise Development
MRP	Material Requirement Planning
NACOSTI	Nation Council for Science Technology and Innovation
NCIP	Northern Corridor Integration Project
NGO	Non Governmental Organizations
PFAS	Procurement and Freight and Resource Auctioning
PHD	Doctor of Philosophy
REO	Regional Economic Outlook
RFID	Radio Frequency Identification
RIVATEX	Rift Valley Textile Limited
SCM	Supply Chain Management

SD	Standard Deviation
SEM	Structural Equation Modeling
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences
TAT	Technologies and Tactics
TMS	Transport Management System
UNHCR	United Nations High Commissioner for Refugees
US	United States
USCOC	United States Chamber Of Commerce
VMI	Vender Management Integration
WMS	Warehouse Management System
XML	Extensible Markup Language

OPERATIONAL DEFINITION OF TERMS

- Textile manufacturing firms** Refers to yeaning organizations that undertakes the art of transformation of raw materials into either intermediate goods or final products through mechanized process (KAM, 2015).
- Firm Performance:** An assessment of how performance is on three specific areas of firm outcomes: financial performance, market performance, and customer value added (Richard, Devinney, Yip, & Johnson, 2009).
- Supply Chain Management:** SCM encompasses the planning and management of all activities involved in sourcing and procurement, conversion, and all logistics management activities, it integrates supply and demand management within and across companies (CSCMP, 2013).
- Performance indicators** are metrics expected to express quantitatively the effectiveness or efficiency or both, of a part of or a whole process, or system, against a given norm or target (Lohman, Fortuin & Wouters, 2004).
- Inventory management** is a system concerned with integration of information, transportation, acquisition, inspection, material handling, warehousing, packaging and control of supplies and ensuring security of inventory (David, 2016)

- Transport management** is the planning, controlling and decision making on operational area of logistics that geographically moved and positioned inventory (Bowersox, *et al.*, 2010).
- Supply chain information** is defined as “technologies that can be applied in isolation or in combination with other technologies or the supply chain business processes and supply chain network structure to create supply chain innovation” (Arlbjørn *et al.*, 2011).
- Supply Chain Performance** supply chain performance for a firm is the performance of the various processes included within the firm’s supply chain function (Srinivasan, 2011).

ABSTRACT

The purpose of the study was to analyze supply chain determinants of organizational performance in terms of profitability reliability and responsiveness among textile manufacturing firms in Kenya. Moreover the study investigates the moderating effect of background characteristics on the relationship between supply chain determinants and organizational performance. The study was guided by the following specific objectives; to determine the effect of supply chain information systems on organizational performance among textile manufacturing firms in Kenya, to examine the effect of inventory management on organizational performance among textile manufacturing firms in Kenya, to evaluate the effect of buyer supplier relationship management on organizational performance among textile manufacturing firms in Kenya, to determine the effect of transport management on organizational performance among textile manufacturing firms in Kenya and to assess the effect of warehouse management on organizational performance among textile manufacturing firms in Kenya. The study was informed by a number of theories that included; game theory, relational exchange theory, Supply chain network theory and lean theory. The study adopted the convergent parallel design and targeted a total of 1082 employees, and 104 departmental heads drawn from various departments of the respective textile manufacturing industries operating in Nairobi City County. Two stage sampling method was used to select a sample size of 290 which is a total of employees and heads of departmental units. Questionnaires and interview schedules were used to gather both quantitative and qualitative data commensurate with the needs of the mixed methods design. The statistical package for social sciences (SPSS Version 22) was used to analyze quantitative data both descriptively and inferentially. Hierarchical multiple regression was used to test the effect of the supply chain determinants on organizational performance. Qualitative analysis was used to identify recurring themes in the qualitative data. The results indicates that supply chain information systems, inventory management, buyer-supplier relationship, transport management, and warehouse management positively and significantly affect organizational performance. Background characteristics do not moderates the relationship between each of independent variables and organizational

performance. Qualitative data analysis results revealed some challenges associated with supply chains in the textile firms. Distrust as a result of lack of transparency in operations, delayed supplier payments, contractual conflicts, automation of warehouses, poor mechanisms of vehicle scheduling and tracking, inefficient modern inventory management practises and warehouse layout were reported. The study therefore recommends that management needs to address challenges experienced in automation and layout of warehouses. The study further recommends that trust be build in the customer-supplier network by sticking to agreed payment modes and contractual obligations, introduction of modern inventory systems and automation, hiring of experts to consolidate ICT infrastructure and adoption of vehicle scheduling. Policy makers both in public and private entities should establish relationship to ensure policies which govern manufacturing sector are utilized harmoniously. The study concludes that there was a strong positive correlation between supply chain determinants and organizational performance among the textile manufacturing firms.

CHAPTER ONE

INTRODUCTION

1.1 Background of the study

The textile industry has gained recognition for its potential to contribute towards National development. Consequently, the Ministry of Industrialization and Enterprise Development has deemed it suitable to leverage Kenya's attainment of middle industrial economy status on the textile industry (MOIED, 2015). Despite recognition of the potential the industry possesses, it continues to face challenges such as infiltration by corrupt cartels and use of obsolete technology (Tuikong & Kurgat, 2015). In order for the industry to strive to remain competitive through value creation, an understanding of the complexity and dynamism of its supply chain management has potential to provide the platform upon which the success or failure of this important industry could be judged. Challenges faced by the textile firms in Kenya could for instance, be addressed if executives of such firms were made aware of supply chain factors that could determine organizational performance in the textile industry and how they could impact on overall performance of these firms.

1.1.2 Supply chain

Competitive advantage remains a key focus among organizations yearning to enhance their performance relative to their competitors. A plethora of studies point to the desire to understand how to sustain competitive advantage among competing organizations (Porter & Kramer, 2006; Liao & Hu, 2007). It is argued that this desire among organizations informs strategic management decisions (Flint & Van Fleet, 2005; King, 2007). In such a scenario of sustaining competitive advantage, Jain, Dangeyach, Agarwal and Banerjee (2010) contend that supply chain management takes on, a more central role that requires keen interest. In essence, the argument then is that processes under the supply chain possess the key to unlock organizations competitive ability.

The supply chain also referred to as the value chain is defined variedly among scholars in relation to their specific industry area. However, most contemporary definitions build on the definitions advanced by (Arora, 2014). In this definition value chain is viewed to comprise of primary activities that focus on among other core values; logistics for in bonds, operations, out-bond logistics, sales and marketing, and services. Building on this definition, Kaplinsky and Morris (2006) define the value chain in terms of service and product flow. Consequently, these authors posit that the supply chain relates to activities undertaken to oversee the flow of a product or service through the stages of conception, production, delivery and disposal.

Deshipande (2012) builds on the goods flow thinking by contending that a supply chain is the linkage of a set of organizations by flows of services, finances, products, and information either upstream or downstream from a given source to an intended customer. USAID however takes a different position as regards the value chain is concerned. A USAID brief (2008) argues that key sectors experience sector – level constraints that tend to affect individual first, yet these individual firms lack ability to address them on their own. Consequently, efforts aimed at increasing competitiveness should look to focus more on across firm cooperation as opposed to individual firms. Moreover, it argues that a value chain differs from a supply chain in that it emphasizes more on value creation throughout its segments (USAID, 2008).

More recent definitions on supply chain builds on the premise of cooperation of involved parties for the benefits of the customer. Chopra and Mendl (2010) for instance views a supply chain as a direct or indirect involvement of manufacturers, suppliers, retailers, warehouses, transporters and customers for purposes of meeting customer needs. Harrison and Hoek (2005) on their part regard the supply chain as intra and Inter organizational processes used to maneuver from the purchasing side all the way up to the distribution of products done physically. Although it is acknowledged that the supply chain offers potential for a new form of organizations, it is however noted that inter-industry players sometimes have complicated interactions such that the envisaged value or supply chain fails to meet market and

hierarchy category needs (Alflayyeh, 2013). Besides, it is also reported that scanty information exists as to how diverse supply networks impact on performance (Zhang & Dilts, 2004). The panacea possibly lies in the management of these chains.

1.1.2 Supply chain management

The business environment in contemporary society is bedeviled by growing challenges arising from turbulence markets, emerging changes occasioned by technology, ever changing customer tastes, and global competition. All these factors combine to make supply chain to be more complex and requiring prudent management. It is argued that the competitive business environment pushes firms to focus on a multiplicity of performance requires that include but not limited to delivery, quality, flexibility, and efficiency (Roh *et al.*, 2014; Park & Hong, 2013). This ends up complicating the supply chains more since they occasionally involves hundreds or thousands of firms. Under such circumstances it is imperative to manage the supply chains.

According to Deshpande (2012). Supply chain management involves the management of components of a supply chain. Consequently, supply chain management is an Orchestrated way of handling business functions that were hitherto traditional, and approaches to these function across and within businesses with a view to sustaining performance of individual firms within a supply chain. Technological development has seen an evolution of diversity in supply chains both in terms of chain linkage as well as in terms of ingredients of performance. This has led varied interpretations of supply chain management among researchers. (Jain *et al.*, 2010) for instance, views supply chain management in terms of facilities and available distribution options networked so as to perform key functions of material procurement, production, and distribution of the products to customers. In another perspective supply chain management is the creation of a distribution system through which facilities for procurement of raw materials, production of intermediate and final products and delivery of these products to customers is integrated (CSCMP, 2013).

Supply chain management is viewed in terms of networked organizations yearning to optimize product value to the customer by exploiting their linkages both upstream and downstream (Christopher,2005).Whichever definition one looks at, the key element of networking emerges. Supply chain management can therefore be viewed as a networking approach through which human resources financial resources, materials, and information is managed across and within a supply chain with a view optimizing customer satisfaction and competitive advantage.

1.1.3 Development of supply chain management

Interest in supply chain management dates back to the dormant years prior to 1950 when logistics as noted by (Habib, 2011) was not treated as a strategic function.The first transformation is reported to have led to recognition of logistics occasioned by the need to manage physical distribution in manufacturing firms (Haskett *et al.*, 1964 as cited in Habib, 2011). Logistics were therefore employed to handle physical distribution which at the time was treated as an independent organizational function.

The coming of supply chain management is reported to have been informed by realization that the supply chain ought to be viewed as single function where decisions pertaining to the management of the chain are made at the top level (Gripsrud, 2006). The concept of SCM as currently used owes its development to a change in paradigm on how to manage modern business. This paradigm shift sees entities networking with each other as opposed to competing individually (Drucker, 2002).

Since then several studies have been conducted to examine the adoption of SCM in diverse contexts. (Habib, 2011) for instance, is reputed to have authored the first ever paper concerning SCM as applied in the service industry when examining SCM in health services. More studies focusing on SCM in the service industry have since been conducted (Sampson, 2000; Kathawala *et al.*, 2003; Cigolini *et al.*, 2004). Another context that has interest on SCM is the educational context (Lau, 2007).The evolution of SCM can therefore be segmented into destructive stages in line with findings by others (Movahedi *et al.*; 2009; Ronald, 2007). According to Movahedi

and others, the evolution of supply chain management can be traced through the creation era of the 1980s, the integration era of the early 90s continuing into the 21st century, and current era of globalization. Under this school of thought of Movahedi *et al.* (2009), the creation era provides customers and suppliers. The platform to understand potential benefit of cooperation and hence the need for supply chain management.

The integration era on the contrary introduces sophistication in information technology systems used. Consequently, the Electronic Data Interchange (EDI) system gets replaced by the Enterprise Resource Planning (ERP) system, which not only focuses on resource management within individual firms but also on resources within the integrated chain (Movahedi *et al.*, 2009). On the contrary, the globalization era has witnessed cut throat competition occasioned by trade liberation policies thereby requiring a unity of purpose among organizations that can link with each other. Literature however traces interest shown towards the concept of supply chain management as a response towards recognition of the need to capitalize on customer satisfaction to remain competitive (Blome *et al.*, 2014; Cousins, 2005). In this regard, it is noted that in its original form, the supply chain concentrated more on the integration intra organization functions (Flynn *et al.*, 2010). The supply chain management scope has only broadened with time to the present form that also incorporates a focus across organizations. Several components are associated with the supply chain within organizations.

The concept of supply chain management is gaining more prominence among organizations as they strive to remain competitive in today's global markets that are ever more dynamic. Supply chain practices are becoming more and more central to improved performance and value creation within organizations. Focus is now more on networked business operations that require heavy investment in supply chain management practices. It is argued that through improvements targeting the supply chain, firms as well as customers and partners stand to reap more benefits (Kepher, Shalle & Oduma, 2015). A review of literature identifies several supply chain

factors that determine organizational performance of companies in diverse sectors as highlighted in the following sections.

1.1.4 Global Perspective of Supply Chain Determinants

Interest on improvement of supply chains to meet competition requirements remains a global phenomenon. Several scholars have sought to examine determinants of organizational performance from among the many internal and external factors associated with supply chain management. Queseda, Gazo and Sanchez (2012) for instance while examining critical factors that affect supply chain management in the context of the US pallet industry, identify information technology, supply chain relationships and customer satisfaction as among the critical factors. These authors underscore the importance of information technology not only in the reduction of paper work and lead time within the supply chain, but also in ensuring a coordinated flow of information that tends to impact positively on inventory management. In addition, Queseda *et al.* (2012) identify buyer–supplier relationships management as the framework through which activities within the supply chain can be coordinated and integrated to the firms' benefits.

Interest in supply chain determinants of performance has also been observed among European countries. Several scholars have pointed towards information technology as a crucial element in successful supply chain management and by extension, in organizational performance (Setia & Patel, 2013; Jin *et al.*, 2014). Han, Wang and Naim (2017) in acknowledging the role of information technology posit that flexibility of information technology though equally important, is often ignored. Consequently, they conducted a study in Cardiff focusing on how IT flexibility could be conceptualized for purposes of supply chain management. Using Structural Equation Modelling (SEM), Han *et al.* (2017) concluded that IT flexibility was a significant determinant of supply chain management that enables the targeting of key resource investments and hence optimal use of IT potential in a firm.

Information sharing has also been identified as potential supply chain determinant of organizational performance. Ali, Babai, Boylan and Syntetos (2017) conducted a

study in major supermarkets located in Germany and focused on how performance could be forecasted in the event that information was not shared within supply chains. They build on evidence that tend to suggest that even when various information systems are successfully implemented, such as Enterprise Resource Planning, many firms are still held back performance wise by issues related to sharing information (Courtin, 2013). In their conclusion, Ali *et al.* (2017) argued that sharing information enables supply chains to be more effective in linking the upstream plan with actual consumer demands. Indeed, the importance of information sharing to organizational performance is such that some manufacturers have even opted to offer incentives for purposes of sharing information (Cannella *et al.*, 2015; Gao, 2015; Heese & Kemahlioglu-Ziya, 2016).

The context in which a study is conducted has also been found to dictate supply chain factors related to organizational performance. Zekic and Samarzija (2017) for instance while examining the impact of selected supply chain determinants on performance of wood industry clusters in the Croatian context found partner relationship as a significant predictor of performance of wood industry clusters. However, information technology which features strongly in other studies as being a significant supply chain determinant of performance (Setia & Patel, 2013; Jin *et al.*, 2014), was in the case of Croatia wood industry found to be non-significant in the prediction of cluster performance. The implication of these contradictions is that though some factors have been labeled as determinants of supply chain performance while others have not, more studies need to be conducted in diverse business contexts.

The need to identify supply chain determinants of organizational performance has extended to the Asian countries (India, Malaysia, Bangladesh and China), perhaps, with a view to suggesting policy guidelines that could lead to improvements in the supply chains. Kumar, Rajesh and Shankar (2015) for instance, examined factors critical to the success of the implementation of the management of supply chains in small and medium enterprises in India. Arguing that SMEs in most developing countries face problems related to supply chain management, these authors identified

13 factors that had positive correlations with performance measure. Among these factors included: use of modern technologies, information sharing, trust developments among supply chain partners and devoting resources for the supply chain. The implication of findings by Kumar *et al.* (2015) is that so many factors exist that have potential to impact on the success of supply chain management and therefore there is still room to further explore other determinants while verifying those that have been identified across a diversity of sectors.

Supply chain determinants of organizational performance have also been examined from a strategic point of view. Rana, Osman, Bin-Bahari and Solaiman (2015) used a structured questionnaire to collect data pertaining to selected retail chain stores drawn from Bangladesh. Results of data analyzed using partial least squares method revealed that agility in the supply chain by way of strengthening buyer–supplier relationships to be more responsive to customer needs was the most pivotal strategy in the performance of retail chain stores. Additionally, other studies conducted in Malaysia, emphasize the role information sharing plays in supply management such as, reduction in inventory, efficient management of inventories, strengthening social bonds and improvement in delivery time (Lofti, Mukhtar, Sahran & Zadeh, 2013).

Supply chain determinants of performance have also been examined from the Iranian context. Yousefi and Alibabaei (2015) conducted a study focusing specifically on information flow in the context of pharmaceutical supply chain. Key among their findings was that information systems which constitute of Electronic Data Interchange (EDI), Electronic Fund Transfer (EFT), Extensible Markup Language (XML) and barcode and Radio frequency identification (RFID), plays a significant role in the pharmaceutical supply chain. They argue that the systems complement each other and are most effective when they are applied together. The bottom line is that in almost all sectors, the organizational performance is dependent on a variety of supply chain factors for its optimum performance. It is imperative to note that from the array of studies examined globally, no specific mention of the textile industry has been made.

1.1.5 Regional Perspective of Supply Chain Determinants

In Sub-Saharan Africa, several studies have illuminated several key factors such as transport, information technology and others as being responsible for driving supply chain performance in firms. Indeed, on the basis of the regional economic outlook report (REO, 2015) factors such as increased openness and new trade partnerships have been attributed to rapid expansion of sub-Saharan Africa's trade experience in the last two decades. The conception is that during the said period, sub-Saharan African has forged new trade partnerships with the likes of Brazil, China and India. China is noted to have emerged as the most important single trade partner of Sub Saharan Africa (REO, 2015)

The realization of the central role that infrastructure plays in supply chain performance for instance, has seen initiation of several large-scale infrastructure projects in the East African region. The following are some of the infrastructural projects identified by the US chamber of commerce (USCOC, 2016): the Northern Corridor Integration Project (NCIP) encompasses 16 separate infrastructure projects including the standard Gauge Railway aimed at linking Landlocked states in East Africa to the port of Mombasa, Kenya; Ethiopia's new standard Gauge Railway covering 5000 km and aimed at linking Ethiopia to the Indian Ocean, and Tanzania's Bagamoyo Port project hoped to be East Africa's largest port on its completion.

Interest in supply chain determinants of organizational performance has also been shown among scholars drawn from Nigeria. Njoku and Kalu (2015) conducted a study focusing on establishing how strategic supply chain management impacts profitability in the flour mills industry. The authors used multiple regressions to show that use of suitable supply chain variables such as location, production, inventory, and transport has potential to improve supply chain management that results in overall performance in the flour mills industry. The need to address supply chain management further, is informed by recommendations showing a need to abandon fragmented approaches in view of emerging technology and global competition, (Njoku & Kalu, 2015).

Ibrahim and Hamid (2012) conducted a study among manufacturing firms in Sudan ostensibly to examine how management practices used among their supply chains affected the performance of these chains. The authors sought to build on the understanding that effectiveness in supply chain performance has potential to impact suppliers and manufacturers both directly and indirectly (Ling & Tan, 2012). The study revealed that buyer-supplier management, information sharing, and speed of responsiveness were critical practices for the effectiveness of supply chain performance among manufacturing firms in Sudan.

A part from the issue of infrastructure that seems to figure prominently amongst determinants associated with performance of supply chains in firms in the African context, technology related issues are also emerging as key supply chain factors determining the success of organizations in the region. In a study conducted in the Cocoa industry in Ghana, Otchere, Annan and Quansah (2013) sought to assess integration of supply chain management in the cocoa industry and challenges that comes with it. The authors established that technological innovations, information sharing and integrated data bases were major challenges to supply chain performance.

Moroccan Samadi and Kassou (2016) taking cognizance of results showing that in an endeavour to enhance supply chains, many firms have invested heavily on information technology (Ye & Wang, 2013), conducted a systematic literature review involving 33 papers with IT themes to find out the relationships between IT integration and the performance of supply chains. The review revealed that the culture of information sharing and inter organization collaboration that may also be referred to as buyer supplier-relationship are cited as among the critical factors required for IT productivity to be optimized in supply chains.

Studies focusing on supply chain factors that influence performance have also been conducted among South African businesses. Badenhorst–Weiss and Waugh (2015) examined the supply chain factors and risks that influence performance from a logistics sector’s perspective. Using an exploratory study, the authors were able to highlight transportation and human resource as key challenges to supply chains in the

logistics industry. In yet another study conducted in the South African wine supply chain, Jooste, Van Eeden and Van Dyk (2015) identify supply chain strategy through the activities of warehousing, transportation, supply, inventory management, customer response, and segmentation according to customers, supply and demand as major determinants of supply chain in the wine industry in South Africa. Despite the many regional studies focusing on determinants of supply chain organizational performance on diverse business contexts, it is clear that whereas many studies have looked at supply chains in manufacturing industries, very few have specifically focused on textile manufacturing firms (Cao, Scudder & Diskson, 2017; Georgise, Thoben, & Silfert, 2014).

1.1.6 Local Perspective supply chain Determinants

In Kenya, the understanding that improvement in procurement performance for instance leads to a reduction in procurement costs and improved organizational performance (Osuga *et al.*, 2015; Kimotho, 2014; Muma *et al.*, 2014) has led to a series of studies seeking to examine supply chain determinants of organizational performance across many sectors. Mulwa (2015) focused on organizations while examining determinants of supply chain management. He identifies ICT and integrations of its systems, buyer-supplier collaborations, information sharing, trust and human resource as key organization related supply chain determinants of performance.

The ability of supply chain management to reduce operational costs has also been examined from an agricultural perspective. Omai (2013) examined supply chain determinants of performance in tea factories in Kisii County by focusing on electronic procurement. From a conceptualization that supply chain performance is a function of information sharing, partner relationships, supply chain integration, and supplier appraisal, the study established that information sharing, partner relationships and integration of the ERP system enhance the performance of supply chains in the tea industry. Another study focusing on supply chain determinants of performance in the sugar sector identified technology adoption and early supplier

involvement as central to supply chain performance in the sector (Bushuru, Namusonge, Biraori & Wamalwa, 2014).

Examination of supply chain determinants of performance in Kenya has not excluded the public sector. Nyamasege and Biraori (2015) conducted a study on effectiveness of the management of supply chain as a result of prudent management of supplier relationship. From a conceptual premise that supplier relationships, inventory management, information technology, distribution and training were functions of supply chain effectiveness, the authors concluded that the effectiveness of supply chains in the public sector largely depends on supplier relations strategies such as management of supplier relationships, inventory management, information technology and management of the distribution channel.

The energy sector in Kenya has also benefitted from studies interested in establishing supply chain determinants of performance. Osoro, Muturi and Ngugi (2016) focused on supply chain determinants of performance in the petroleum industry and found out that the distribution channel in form of pricing and transportation of oil together with the legal and regulatory environment were key supply chain factors contributing towards performance of the oil industry in Kenya. In view of the findings by Osoro *et al.* (2016), it is apparent that whereas operational factors such as pricing and transportation contribute significantly to performance of supply chains in the petroleum industry, government regulations are at the core of performance in the industry.

Buyer–supplier relationships management as a supply chain determinant of performance have also received recognition from scholars in Kenya. Ideet and Wanyoike (2012) focused on the Kenya Power and geothermal development companies to examine the contribution buyer-supplier relationship have on supply chain performance. The study used the descriptive research design and multiple regressions to show that trust, partnership initiatives, and information sharing were significant predictors of supply chain performance in the context of the energy sector. The findings not only lend credence to other similar findings but also bring to

the fore the possibility of improvement of energy sector supply chains provided that key operational factors are taken into consideration.

Several studies approach the issue of supply chain determinants of performance from an environmental perspective. As a realization of the benefits that could accrue from adopting an environmentally conscious purchasing approach cited by Dheeray and Vishal (2012), Barasa, Namusonge and Iravo (2015) sought to examine contributions of management practices used for green supply chain on the performance of steel companies operating in Kenya. The authors established that the correlation between performance of the steel manufacturing firms and green supply chain practices was moderately positive. The implication from these findings is that determinants of green supply chain performance are similar to determinants of supply chain performance in general.

Still on manufacturing firms, the diversity in possible supply chains determinants of performance is manifested in a study by Wabwile and Namusonge (2015) which focused on outsourcing in East African Breweries Limited as a competitive strategy suitable for supply chain management. The study by the two scholars revealed that outsourcing of services such as security, training, medical and logistics significantly impacts on performance in terms of cost efficiency, quality of products and services, service delivery, operational efficiency and responsiveness.

Other sectors such as the nongovernmental organizations, retail institutions, water companies, and construction have featured prominently in local studies related to supply chain determinants of performance (Kimondo, Mutuku & Winja, 2015; Omondi, & Namusonge, 2015; Siambi & Okibo, 2014; Mwangi 2013; Ang'ana, 2012). Mwangi (2013) for instance focused on the impact of inventory management on supply chain performance in the Agricultural sectors. Through a diverse array of inventory management practices, the study revealed that EOQ, JIT, marginal analysis, vendor managed inventory, and order batching contribute significantly to the variance in supply chain performance among agricultural firms.

Siambi and Okibo (2014) focused on strategic management of supply chains in ELDOWAS Company. The study used the descriptive survey design to show that resource sharing, information flow, and infrastructure were significant determinants of organizational performance. Findings from a study conducted by Ang'ana (2012) on determinants of supply chain management for road construction projects further revealed that material flow and information technology were the key drivers of supply chain performance among the road construction projects. Furthermore, strategic supplier partnership, customer relationship, information sharing, and sourcing were found, through a cross-section survey design to be significant predictors of construction project performance (Kimondo *et al.*, 2015).

1.1.7 Textile industry in Kenya

The manufacturing sector plays a critical role to the economy of Kenya resulting in 10% GDP 12.5% exports and 13% formal employment (Osano *et.al*, 2008). Textile manufacturing firms for years faced challenges such as high transportation costs, decrease in local demand, cheap imports and removal of quotas. The growth of textile manufacturing industry has been affected by increased cost of production and poor transportation systems. This situation has forced a number of textile manufacturing firms to close down industrial operations and lay off some of their employees (KAM, 2015). As a result of the governmental changes in terms of policy the participation of public sector in textile manufacturing is much minimal as compared to private sector therefore emphasis is now being driven towards privatization of industrial sector (Awino, 2012)

The manufacturing environment has greatly changed however with such considerations such as advanced technological innovation and globalization has contributed to production of all sizes by firms due to efficiency and effectiveness of inventory management. However with appreciation of challenges proper analysis and improvement of supply chain determinants of organizational performance would lead to value addition. Proper management of the determinants would lead to profit, improved service delivery, growth in market share, effective suppliers and distribution channels.

1.2 Statement of the Problem

Recognition of the Potential of the textile industry to contribute to Kenya's GDP has led to the leveraging of the country's vision for industrialization on the industry (the Kenya Textile and Fashion Industry Report, 2015). Despite this recognition, challenges associated with supply chain management continue to inhibit performance of textile firms. The Kenyan textile sector has experienced a significant shift in policy environment both locally, regionally and even internationally. These policies have had varying impacts on the value chain in the textile industry over time. Perhaps the best moment reported for the performance of the Kenyan textile industry is during the import substitution period (1963-1986). It is argued that during this period, high taxes were levied to facilitate industrialization, and cotton farmers were provided with subsidies to support production (ACTIF, 2013). The consequences of these controls and incentives are that there was booming cotton and the sector was more robust (ACTIF, 2013).

The structural adjustment programme regime experienced between 1986 and the Mid 90s (ACTIF, 2013) heralded a paradigm shift that saw the IMF and World Bank adopt an economic model a kin to private ownership leading to competitive markets in many countries with a view to maintaining standards. During this period, policy frameworks were more aligned to the concepts of liberalization, privatization and export promotion which saw a decline in government and donor support to the textile sector. This according to the ACTIF report (2013) was the inception of the decline of

the cotton /textile sector which was being displaced by second hand textiles that had been earmarked for the Great Lakes region

The changing operational environment meant that the value chain was thrown into confusion and was largely characterized by lack of guidelines for cotton/textile management, withdrawal of support from the Government, absence of lobbyists to agitate for governance structure, lack of strategy in position and lack of competitiveness (ACTIF, 2013). High cost of production, stiff competition and corruption have also been found to be key issues bedeviling textile supply chains (Tuigong and Kurgat, 2015). Tuigong and Kipkurgat contend that human resources are a key challenge facing textile firms in Kenya. They cite financial constraints as the reason for hiring cheap but unskilled labour leading to poor quality of produce.

A major concern of the present study is the capacity of the textile supply chain to manage complexity, rapid change and trend responsiveness. The clamour for used clothing popularly known as 'mitumba' shows that consumers are demanding greater variety of cheaper and high quality products delivered consistently. There however seems to be a significant disconnect between what consumers want and what textile firms in Kenya are capable to provide. This reflects a disjointed and less than streamlined supply chain.

The researcher asks how textile supply chains can build capacity to streamline operations and drive profitability. The purpose of this study was therefore to establish supply chain determinants of organizational performance in the context of textile manufacturing firms.

1.3 Objectives of the Study

The study was guided by the following objectives.

1.3.1 General Objective

The general objective of the current study was to assess supply chain determinants of organizational performance among textile manufacturing firms in Kenya and the moderating effect of background characteristics.

1.3.2 Specific Objectives

The realization of the general objective above was anchored on the following specific objectives.

1. To examine the effect of supply chain information systems on organizational performance among textile manufacturing firms in Kenya.
2. To establish the effect of inventory management on organizational performance among textile manufacturing firms in Kenya.
3. To evaluate the effect of buyer–supplier relationship management on organizational performance among textile manufacturing firms in Kenya.
4. To determine the effect of transport management on organizational performance among textile manufacturing firms in Kenya.
5. To analyze the effect of warehouse management on organizational performance among textile manufacturing firms in Kenya.
6. To establish the moderating influence of background characteristics on the relationship between supply chain determinants and organizational performance.

1.4 Hypotheses of Study

- H01:** Supply chain information systems have no significant effect on organizational performance among textile manufacturing firms in Kenya.
- H02:** Inventory management has no significant effect on organizational performance among textile manufacturing firms in Kenya.
- H03:** Buyer–supplier relationship management has no significant effect on organizational performance among textile manufacturing firms in Kenya.
- H04:** Transport management has no significant effect on organizational performance among textile manufacturing firms in Kenya.
- H05:** Warehouse management has no significant effect on organizational performance among textile manufacturing firms in Kenya.
- H06:** Background characteristics have no significant moderating influence on the relationship between supply chain determinants and organizational performance.

1.5 Justifications of the Study

The contributions made by the textile and apparel sector towards Kenya's endeavor to meet its desired middle income status and the challenges facing the industry as a whole informed the need to conduct this study. Supply chain Management is a functional area which contributes immensely to the success or failure of a manufacturing company. Therefore the management of textile manufacturing firms stands to benefit from information regarding essential determinants of supply chain management and the influence they pose on the overall efficiency of the organization

A lot of research related to the field of supply chain has been conducted by various scholars. However, it still remains unclear how the supply chain in the textile industry can be harnessed to manage complexity and change, and to be more trend responsive.

This study therefore intends to provide information that can inform exploitation of the textile supply chain for seamless operations and driving profitability.

The findings of the study are therefore expected to create value addition to the following stakeholders:

a) Government and policy makers

It was viewed that the study findings generates potential benefits to industry players as well the other stakeholders such as the Government of Kenya through the Ministry of industrialization and enterprise development. Moreover the study findings provide an avenue that the ministry of industrialization can use to address the basic constraints to performance among textile manufacturing firms in the country. The study relevance provides appropriate information of supply chain determinants to Policy makers both in private and public entities which may enable them to formulate better policies regarding inventory management, transport management, warehousing management, supply chain information systems and customer supplier relationship. Therefore from the findings the regulations can be derived that intends to enhance efficiencies and effectiveness to improve textile manufacturing sector thereby increasing the national GDP and by extension job creation is realized.

b) Grant Agencies

Local and international granting foundations provide funding resources to government or non-governmental projects in partner developing nations as they tend to design and implement their academic strategies. This study enables them to understand the entire supply chain function in order to make appropriate strategic decisions pertaining funding.

c) Manufacturing Firms

The study findings provide textile industries a springboard from which they exploit existing frameworks in order to identify appropriate supply chain determinants which can contribute in improving organizational performance and hence regain relevance

in the competitive market. It also offers base for improving the growth of the firm, production increase, manufacture of quality products, create environment for customer satisfaction and reduction of the costs of production. The findings therefore propose future developments which Kenyan textile industry may implement in order to attain world class performance best strategies.

d) Academic field

The study findings benefits academic community by contributing to the increased body of literature relevant to organizational performance in the Kenyan perspective. Due to limited studies on organizational performance in textile manufacturing industry that has been carried out in developing world, the researchers in the same field may be interested in reviewing the findings of the study especially those based in Kenya. Notably the study recommendations provides more insight for continuing theoretical and empirical research investigations in the field related to supply chain hence resolving of emerging issues and practical improvement of organizational performance adoption.

e) Community

The entire community is poised to reap the benefits of the study findings. In the process of enhancing the supply chain function and wastage reduction and hence the firm creates avenues of generating more funds which will be utilized to finance and expand other viable projects. Additionally ultimate consumers stands better chances of acquiring commodities which meets their demand expectations due to improved production and manufacturing processes.

1.6 Scope of the Study

Scope and delimitations are key parameters offering the study's boundaries, qualifications, exceptions and reservations (Creswell, 2008). Consequently, the scope shows the coverage in terms of academic and geographic contexts while, delimitation narrows down the scope. The geographic scope of the present study included the textile manufacturing industry in Kenya which was narrowed down to the textile

firms operating in Nairobi County. Based on the available data from Kenya Association of Manufacturers (KAM, 2015) more than eighty percent of textile manufacturing firms are located in Nairobi County and surrounding area.

Academically the study's focus was the supply chains ability to influence organizational performance in the textile industry context. The study narrowed down to specific supply chain determinants that included: inventory management, transport management, warehouse management, supply chain information systems and buyer-supplier relationship management. The Choice of these determinants was informed by assertions of Shahzadi, Amin and Chaudhery (2013) indicating that logistical drivers such as inventory, transport and warehousing; and cross-functional drivers that include information and sourcing are major drivers of supply chain organizational performance.

1.7 Limitations of the Study

Data collection relied mainly on the questionnaire and interviews, administering questionnaires to respondents to fill them themselves was limiting since some of the respondents may have given responses that were not well thought out before answering. The researcher therefore recruited and trained two assistants who were required to make a follow up on areas that respondents had difficulties understanding. Moreover, the high non-response rate associated with questionnaire is known to interfere with the external validity. The assistants were asked to ensure that as many of the questionnaires were filled and returned.

Conducting interviews with heads of procurement department was limiting in the sense that the structured nature of the interview schedule might have provided potential for lack of reliability. Besides, success of the interviews did not only depend on the bond of trust between the researcher and the heads of sections but also on the researcher's values. In this regard, data was therefore critically assessed to eliminate possibility of interviewer bias.

Confidentiality policy of the organization played a key role in limiting most of the respondents from answering some of the questionnaires since they regarded the process to be against the organization confidentiality policy which might expose confidential matters of an organization. This was articulated by assuring the respondents that information provided will be used for academic purposes and treated confidential.

Additionally most of textile manufacturing firms had insufficient structured procurement and supply chain departmental sections. This implies that some questionnaires were filled by irrelevant officers such as accountants and operational managers who possess little knowledge and experience on procurement and supply chain functions. The issue was addressed by the researcher going through the questionnaire with the respondents so that they can understand the issues accordingly.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter focused on a review of literature related to the key variables under study. The review adapted the conceptual framework approach that sought to examine the concepts of supply chain, its determinants and the concept of organizational performance as existing in literature. Moreover, the review examined empirical evidence on the reported effects of supply chain determinants on organizational performance.

2.2 Theoretical Framework.

The present study was underpinned on a number of theories in relation to the five supply chain determinants that were of interest to this study was concerned. Insight into the rather novel field of supply chain management was therefore believed to benefit greatly from game theory (Dror, Hartman & Chang, 2012), Relational exchange theory (Xiaojun *et al.*, 2015), Supply chain network theory (Hearnshaw & Wilson 2013) and Lean Theory (Heizer & Render, 2006).

2.2.1 Game Theory

Inventory control has remained a critical problem in decisions that involve supplier management. Application of Game theory and in particular, the cooperative game has been shown to play a significant role in transportation logistics and in managing centralized inventory systems that has ultimately led to reduction in costs and an improvement in customer level service (Fiestras-Janeiro, Garcia-Jurado, Meca & Mosquera, 2011). Choice of game theory was therefore multifaceted in terms of situating both inventory management as well as transport management.

Game theory was first proposed by John Von Neumann and Oskar Morgenstern in 1944 as an intellectual framework for analyzing situations. It however did not

provide for equilibrium. John Nash (1951) improved the idea further by demonstrating that equilibrium exists so long as a game has a finite number of players as well as moves. Modern day game theory is therefore defined as the formal study of decision-making where several players are required to make choices that potentially affect the interests of the opposing players; and is deemed as the official study of conflict and cooperation (Xu, Pan & Ballot, 2013).

Game theoretic concepts apply whenever the actions of several agents are interdependent (Dai & Chen, 2012). These agents may be individuals, groups, firms, or any combination of these. The concepts of game theory provide a language to formulate structure, analyze, and understand strategic scenarios such as those required for controlling inventories (Dai & Chen, 2012).

According to Xu *et al.*, (2013), game theory is divided into two main approaches: the non-cooperative and the cooperative game theory. The cooperative game theory is applied to cases where players have potential to achieve more benefit by cooperating than by being on their own (Xu *et al.*, 2013). Mateo and Aghezzaf (2013) argue that cooperative games bring together several players looking to maximize a win-win situation by agreeing to coordinate strategies and share pay offs. The point is that decision makers coalesce and make binding agreements to jointly strategize, bring individual payoffs into single pools, and share total payoffs in a mutually agreeable manner. Analogous to supply chain distribution channel, Mateo and Aghezzaf (2013) point out that managers of different sales-points in a supply chain willing to reduce inventory to carry, can do so by engaging in such a cooperative game. They can decide to cooperate and trade the product at a price fair to both of them. Game theory in this scenario would require that clusters of sales-points willing to cooperate, fair prices to trade and allowable inventory to carry be made consistent with demands of specific supply chains.

The choice of Game theory was also made taking cognizance of its role in logistics management. Slimani and Achchab (2014) agree that due to its ability to be used to analyze and solve situations where opposing player's decisions affect each others payoffs, game theory provides the avenue upon which analysis of transportation and

inventory could be maximized. Consequently, in the supply chain for instance, game theory offers the basis on which a retailer in demand of a final product cooperates with a supplier of raw materials for purposes of managing the transport function. The gain sharing issue was intensively investigated in the cooperative game theory; the cooperative game theory is therefore posited as ideal in examining logistics and inventory in organizations. Today cooperation is becoming more and more crucial to improve the global performance of logistics (Drechsel & Kimms, 2010).

In game theory, horizontal cooperation in logistics was proved efficient to reduce global cost and improve the performance level (Crujssen, Cools, & Dullaert, 2007); (Pan, Ballot, Fontane & Hakimi, 2012). However, despite these advantages, horizontal cooperation is not considerably employed in logistics (Muir, 2010). One main obstacle in the implementation of horizontal cooperation is the absence of an appropriate cooperation decision making model (Xu *et al.*, 2013). In this study cooperative-game-theoretic approach was used to facilitate the decision making in measuring logistics efficiency on transportation and influence attributed to firm performance.

The cooperative game theory made attempts to establish how players interacted with each other in a cooperative relationship, and provided many approaches to fair profit allocation and stable coalition formation, which were important components in the cooperation model (Dror, Hartman & Chang, 2012). This form of cooperation took place between companies operating at the same level of market and it requested them to share private information and resources in logistics (Drechsel & Kimms, 2010). The aim was to improve the efficiency in transportation logistics; for example, reduce logistics cost (Crujssen, *et al.*, 2007) or reduce environmental impact caused by transportation activities (Pan *et al.*, 2011). The theory focused on transportation cost aspect.

It was proved in the literatures that the horizontal cooperation in logistics could result in a 10% or higher percentage of cost reduction in transportation (Groothedd *et al.*, 2005; Ergun *et al.*, 2007; Pan *et al.*, 2011). Considering the size of manufacturing industry in Kenya, it was a huge stake. The study on transportation management and

manufacturing firm performance in this study was guided by the concepts postulated by the game theory. This theory was deemed relevant as it portends an improvement in transport efficiency particularly from a transportation cost perspective which explains why the choice of the theory for the present study was prudent.

2.2.2 Relational Exchange Theory

Information systems though central in supply chain operations can not work in isolation. More often than not, several systems work in an interrelated way that relies on innovative potential. Supply chain information systems are therefore best understood from a relational theory perspective. Relational exchange theory was presented by Morgan and Hunt in 1994, ostensibly to model drivers of long term customer-bank relationship to explain interpersonal exchange of benefits and costs.

The theory as noted by Dyer and Singh (1998) tends to explain competitive advantage and superior performance by focusing on dyads and networks of companies as units of analysis. The theory proposes that the greater the partners' investment is in inter-firm knowledge sharing routines and relation-specific assets, the greater the potential will be for relational rents.

Knowledge sharing is no doubt a function of information systems adopted by organizations. Consequently, when firms adopt standard norms for specific systems, then they create relational norms as partners allowing for the application of the relational exchange theory. Gachengo and Kyalo (2015) posit that relationism builds economically viable relationships that result in financial performance. Moreover, relationism provides an atmosphere that promotes communication of innovation in technology (Xiaojun *et al.*, 2015), which by extension allows for the integration of a diversity of information systems. According to Blackhurst, Dunn and Craighead (2011) relational competencies such as defined communication networks, developed supplier relationship management programs and monitoring systems are positively related to supply chain resilience. In the present study, the relational view was the basis to understand how superior relational competencies can improve organizational performance.

Relational theory was particularly deemed relevant for the present study due to the fact that it is well suited in the software innovations and absorption of information technology as well as information systems such as those used in supply chains. Moreover, Inter-organizational informational system-a supply chain informational infrastructure- can disseminate real time demand and supply information throughout the supply chain thus improving performance. Some of the infrastructure necessary include, message-based systems that transmit information to partner technologies such as fax, e-mail, electronic data interchange (EDI) or extensible markup language (XML). Electronic procurement hubs, portals or marketplaces that facilitate purchasing of goods or services electronically promote partnerships (Tang & Zimmerman, 2013). Also important is the collaborative planning, forecasting and replenishment (CPFR) systems, vendor-managed inventory (VMI), efficient consumer response (ECR) and quick response. The adoption of supply chain information systems in any organization significantly influences its organizational performance (Moharana *et al.*, 2014). The relative advantage in essence is that it improves communication between stakeholders, improves information exchange and generally improves the supply chain performance. However, the use of information systems in any industry requires some innovativeness.

2.2.3 Supply Chain network Theory

The networks theory is founded on the rational self-interest paradigm advanced by Sociologist James Coleman in 1988 (Katz, Lazer, Arrow & Contractor, 2004). The assumption by proponents of the theory was that people form dyadic and group ties ostensibly to maximize their own individual preferences and desires. Buyer-supplier relationship management can therefore be viewed in the realm of supply chain networks which Zuo and Kajikawa (2017) refer to as the new analytic paradigm in the management of the supply chain. Zuo, Kajikawa and Mori (2016) argue that supply networks theory enables firms to maintain existing partners active, while at the same time identifying other potential cooperation partners. In essence therefore examination of buyer-supplier relationships is best situated in the supply chain network theory. Supply networks are credited with finding new business partners, increasing efficiency in operations, sourcing for new opportunities, and informing strategic direction (Dyer & Hatch, 2004).

Hearnshaw and Wilson (2013) aver that supply chains can be modelled as a network by a set of “nodes” representing autonomous business units as firms capable of exercising sovereign choices, and as sets of “connections” that link these firms together for the purposes of creating products or services. The linkages between firms represent exchange relationships and the underlying contract if present. The critical connection types are the presence of contracts and various flow types such communication frequency, amount of information sharing, quality of supplier product as material flows, monitoring of supplier market information flows and financial flows. Network theory is descriptive in nature and has primarily been applied in SCM to map activities, actors, and resources in a supply chain. The focus has been on developing long-term, trust-based relationships between the supply chain members. Examples of issues include buyer-supplier relationships, third party logistics, and management roles in supply networks (Gunasekaran, Lai & Cheng 2008).

Building collaborative supply base with supplier is the key element in supplier strategy (Chopra *et al.*, 2007), referred to trust, mutuality, information exchange,

openness and communication as important ingredients in buyer-supplier partnership. (Chopra *et al.*, 2010) claimed that buyer- supplier relationships were becoming more popular in supply chain because of their ability to reduce fraction and uncertainty. According to (Zailani & Rajagopal, 2005). Long-run collaborative relationships with key supplier contribute to firm's financial performance. There is a positive relationship between collaboration and performance (Breuer, Siestrup, Haasis & Wildebrand, 2013). Collaboration with suppliers and customers when responding to risk as well as redesigning products and processes gives firms an advantage through increased information flow, reduced uncertainty, improved quality and increased profitability (Sheffi & Rice, 2005; Richie & Brindley, 2007). Mitchell and Nault (2007) have argued that synchronized business processes such as material, information and financial flows improve supply chain performance thus leading to business growth. Collaborative SC relies on the desire to share information and collaborative management. Effective information sharing among partners is a key determinant in reducing internal and external risk in the supply chain environment

In supply chain management, the network theory is valuable in the analysis of buyer-supplier relationships management. More importantly, it informs choice of supplier strategies and decision making regarding how to handle suppliers. Vinodh *et al.*, (2014) contend that network theory provides the ideal environment for nurturing relationships that encourage trustful exchange making continuity in relationships possible. Choice of the network theory for this study was therefore based on the premise that buyer-supplier relationships management as supply chain determinants of performance needed to be examined via behavioral aspects that play part in improvement of relationships and by consequence, organizational performance (Chaplin & O'Rourke, 2014).

2.2.4 Lean Theory

The lean theory is reported to have its origins in the Toyota Company of Japan (Deckier, 2012). According to Deckier, Sakichi Toyoda, the father of the Toyota system, borrowed the ford production system in 1929 with a view to elevating productivity while reducing waste. Lean theory therefore focuses on optimizing costs

in inventory systems. Some of these costs relate to logistics of which warehousing is a key element. Indeed, Tempelmeier (2011) posits that through lean theory, decisions on warehousing among other supply chain functions can be expedited. On this basis, the researcher was of the view that warehouse management could best be analyzed from a lean theory perspective. It is argued that the global supply chain continues to grow leading to extended lead times that make integration of lean warehousing critical (Kros, Falasca & Nadler, 2006). Imbalances and lack of material flow in the entire supply chain stream is reportedly dependent on warehouse manager's ability to have knowledge on inbound flow and outbound demand supported by the warehouse. The argument posited here is that use of facilities for inbound material logistics and outbound finished goods connects imbalances and the flow of materials.

Maree (2015) acknowledges that changes in manufacturing along with globalization are posing challenges to warehouse management. Maree argues that application of lean principles to warehouse management has potential to lower warehouse costs and increase profits. Among the key principles noted by Maree (2015) as an adaptation from the lean theory is embracing of technology. This then informs the researchers focus on use of Barcode of RFID in warehouse management variables. Maree observes that whereas Barcode systems are low in cost, RFID offer a system of reusable tags. Another principle that can be borrowed from the lean theory for warehouse management in reduction handling. Maree (2015) contends that the more one item is handled, the larger the cost resulting from the needed labour. Such costs can however be removed if barcodes and RFID systems are used.

Use of right storage and shelving solution is also identified as a lean theory principle that can minimize warehousing costs. It is noted that rather than make use of employees who spend hours locating and retrieving items, use of the right inventory system will enable easy locating and storing or picking of items for shipment. Use of customized storage solution keeps materials organized and removes the urge to expand warehousing space (Maree, 2015). Partnering for purposes of reduction in logistics costs is also identified as a lean theory principle relevant to warehouse management. It is noted for instance, that use of the GPS routing technology can reduce time spent getting products to the warehouse. The final lean theory principle that warehouse management can put into use is identified as the just in Time, Every Time. Maree (2015) agrees that just-in-time production and delivery of materials has been proven effective in cost reduction. However, he argues that working with both clients and vendors establishes a schedule that maintains materials and products flow at an even rate, which in essence reduces materials that remain on the shelves for long.

Heizer and Render (2006) indicate that “inventory management or “inventory planning and control” refers to the ongoing provision of standard items with independent demand, where some speculative quantity should always be on hand. Lean theory therefore focuses on optimization of costs in inventory systems. It is posited that through this theory, decisions on manufacturing, warehousing, and general supply chain concerns can be expedited (Tempelmeier, 2011). The theory builds upon the economic order quantity (EOQ) model that seeks to optimize the quantity of any individual item ordered.

Choice of Lean Theory for this study was informed by the need to examine how inventory management influences organizational performance thereby calling for a prudent approach to inventory management. The theory therefore brings to the fore, the possibility of diversity in operating systems used to monitor levels of stock, and the difference in items that may require different treatment. Lean theory is an extension of ideas of just in time. Kros, Falasca, and Nadler (2006), elaborate just in time as a pull-based system designed to align the production and business

processes throughout the supply chain. Green and Inman (2005) assessed the impact of lean theory on financial performance. They say that theory may eliminate buffer stock and minimize waste in production process. Eroglu and Hofer (2011) found that leanness positively affects profitability of a business firm. They argue that inventory leanness is the best inventory control tool. The theory elaborates on how manufacturers gain flexibility in their ordering decisions, reduce the stocks of inventory held on site and eliminate inventory carrying costs. At the aggregate level, the empirical strength of the lean explanation lies both in the timing and the magnitude of the adoption. However in the theory, inventory constrains a firm's ability to respond to fluctuations in demand. Scholarly studies indicate that companies successfully optimize inventory through lean supply chain practices and systems to achieve higher levels of asset utilization and customer satisfaction leading to improved organizational growth, profitability and market share (Green & Inman, 2005).

Another study suggesting a positive relationship between inventory management and performance was that of Eroglu and Hofer (2011) in which their study focused on US manufacturing firms covering the period of 2003-2008. They found that leanness positively affects profit margins. According to Eroglu and Hofer (2011) firms that are leaner than the industry average generally see positive returns to leanness. They used empirical leanness indicator as a measurement for inventory management. Contrary to the present study, their study focused on assessing the relationship between inventory performance and overall firm performance. Criticism leveled against the theory is that it can only be applicable when there is a close and long-term collaboration and sharing of information between a firm and its trading partners.

According to Lean Theory, inventory management act as a major component of any supply chain irrespective of whether it is product or service supply chain. Inventory management plays an important role in matching demand and supply within each and every partner in the entire supply chain, ultimately providing flexibility in coping up with external and internal events of the today's uncertain, globalized

business environment (Bozarth *et al.*, 2010). Ineffective inventory control is a major problem faced by industries in developing countries and that even the very basic inventory control concepts and techniques are not used by the majority of the companies studied. Due to the heavy reliance on imported industrial raw materials and parts, and the endemic bureaucratic delays and associated communication problems in developing countries, order lead times cannot be computed with any degree of accuracy (Chen, Frank, & Wu, 2007). Therefore, the Lean theory is of essence to the effectiveness of inventory management which will result to increased profitability, responsiveness, flexibility, cost effectiveness and asset management.

2.3 Conceptual Framework

Based on the review of literature regarding the impact of supply chain determinants of performance, three sets of variables were distinguished to explain variations in organizational performance relatives to selected supply chain determinants.

The first set of variables was independent variables. These variables included key components of supply chain management namely; supply chain information systems, inventory management, buyer-supplier relationship management, warehouse management, and transport management. Literature is inundated with studies conducted globally showing the role of information systems in organizational performance. Information systems in the form of Electronic Data Interchange (EDI), Electronic Fund Transfer (EFT), Extensible Markup Language (XML), and barcode and Radio Frequency Identification (RFID) have indeed been shown to impact performance of the pharmaceutical supply chains (Yousefi & Alibabaei, 2015). Information technology was also found to impact performance of the Pallet industry in the US, by affecting the value addition process positively (Quesada *et al.*, 2012).

Samadi and Kassou (2016) ascertain that supply chain information systems has an indirect effect on the performance of supply chains in manufacturing firms through systems such as Enterprise Resource Planning (ERP), Supply Chain Management Systems (SCMS), and Manufacturing Execution Systems (MES). Connectivity and

integration of ICT systems are also associated with supply chain performance and by extension, with overall organizational performance (Mulwa, 2015). While not much exists in relation to the textile industry, it was prudent to conceptualize direct effects of supply chain information systems on organizational performance.

The second independent variable of interest was inventory management. Inventory production as a supply chain driver has for instance been found to exert direct influence on performance (Ambe, 2012). Moreover, inventory management is listed as a supply chain strategy that may impact positively on the performance of the wine industry in South Africa (Jooste *et al.*, 2015). A number of inventory management practices that include Economic Order Quantity (EOQ), Just In Time (JIT), Marginal analysis, vendor managed inventory, and Order batching are reported to significantly predict performance in the agricultural sector (Mwangi, 2013) and also in retail institutions (Omondi & Namusonge, 2015). In addition, when referred to as material flow, inventory control has also had a direct effect on the performance of road construction projects (Ang'ana, 2012). On the basis of such evidence, the researcher conceptualized that inventory management could equally have a direct effect on performance of textile firms.

Customer-supplier management cuts across many studies and in theoretical frameworks as having the potential to influence performance. The network theory as reported by Fayezi and Zomorodi (2015) for instance recognizes the contribution of partner-partner relationships in the operations of organization and its influence on performance. Indeed, customer-supplier relationship features prominently in literature as a supply chain determinant of performance (Seghette, 2016; Jooste *et al.*, 2015; Kanda & Iravo, 2015; Mwangi, 2013; Omai, 2013; Ideet & Wanyoike, 2012). It was therefore necessary to visualize customer-supplier relationship as having the potential to affect performance directly.

The fourth variable that was conceptualized as having a direct effect on performance of textile firms was transport management. The basis of considering transport management was the many studies particularly in the African context pointing towards infrastructural challenges in the supply chain. The Regional Economic

Outlook (REO, 2015) clearly isolates transportation as the main determinant of supply chain performance in the sub-Saharan Africa. The impact of transportation on performance is also highlighted in several other studies (Osoro *et al.*, 2016; Badenhorst-Weiss & Waugh, 2015; Njoku & Kalu, 2015; Omondi & Namusonge, 2015; Ambe, 2012). It was therefore prudent to conceptualize similar impacts of transportation on performance in the textile context.

Warehouse management emerges in existing literature as another potential driver to performance. Warehousing for instance has been cited as an important activity that contributes to the supply chain strategy in the South African wine industry (Jooste *et al.*, 2015). Karimi and Namusonge (2014) also point to warehouse management is a crucial component in the supply chain management. Warehouse management measured via the five indicators namely; receiving, put-away, storage, pick-n-pack, and shipping was conceptualized as the fifth variable that could impact on the performance of textile firms.

The second set of variables was the moderating variables. Extensive review of existing literature identifies gender (Vyas-Doorgapersad & Kinoti, 2015); Level of education (Goetsch & Davies, 2006 as cited in Chimwani *et al.*, 2014); age (Kararu & Njeru, 2014); and experience (Braxton 2008) as demographic factors within respondents with potential to moderate the influence of the relationship between supply chain determinants and performance. Respondents' demographic factors were therefore conceptualized as moderating variables in the present study.

The third set of variables involved the dependent variable. Literature shows that measures such as profitability, quality and quantity (Shepherd & Günter, 2012); time, cost, flexibility and quality (Arif-Uz-Zaman & Ahsan, 2014); time, cost, flexibility, quality and innovativeness (Shepherd & Günter, 2012); financial, internal processes, innovation and improvement, and customers (Golrizgashti, 2014); and operations, economic, social and environment (Zailani *et al.*, 2012) are key indicators of organizational performance. For this study, performance was the dependent variable measured using profitability, reliability, responsiveness, flexibility, cost, and asset

management efficiency in line with suggestions by Ganga and Carpinetti (2011 as cited in Leończuk, 2016).

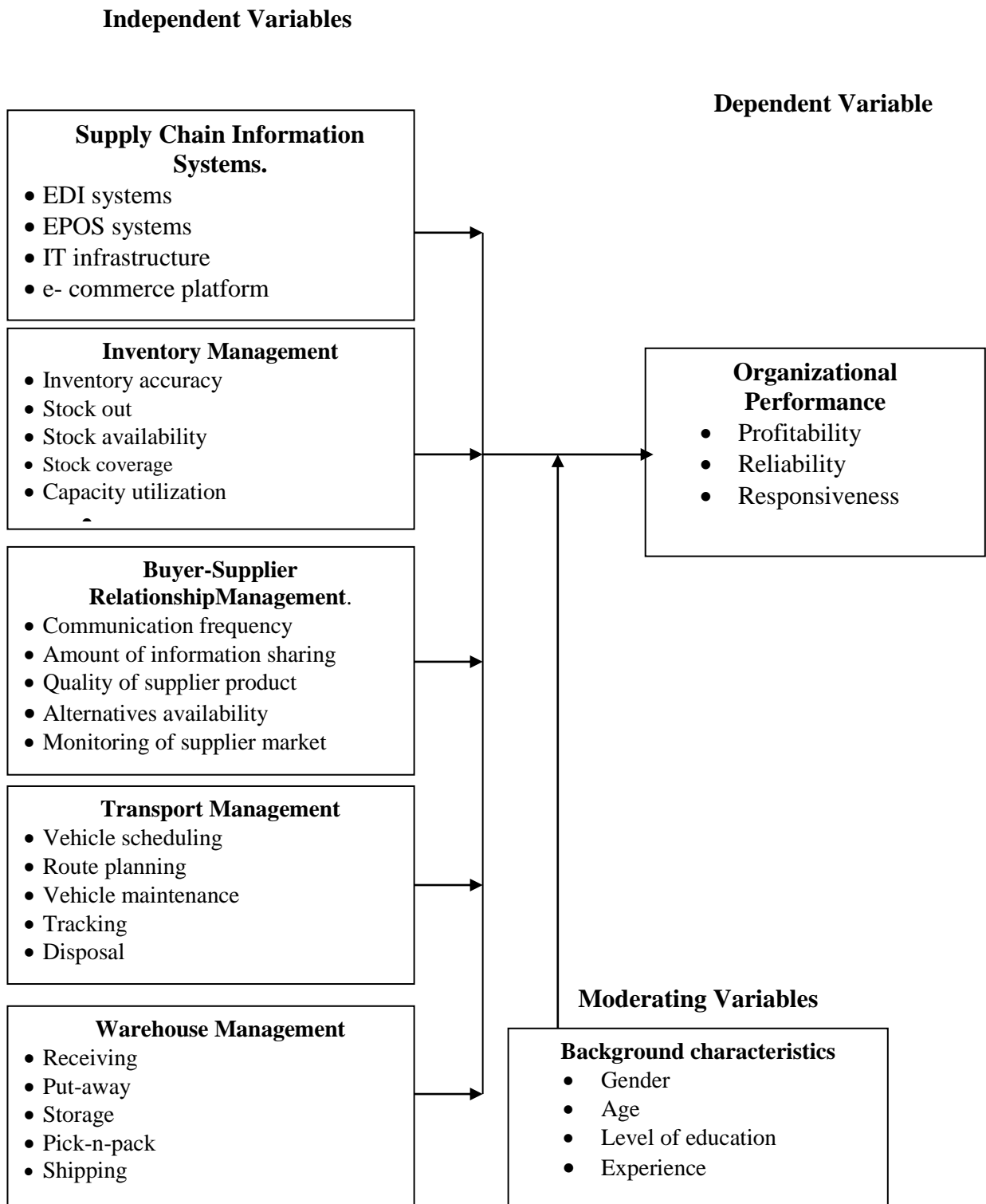


Figure 2.1 Conceptual Framework

2.4 Review of Variables

2.4.1 Supply chain information systems

Supply chain information system is viewed as information that enables the automation of the flow of information along the supply chain thereby, linking the firm and its suppliers in a manner that optimizes planning, sourcing, manufacturing and delivery of products and services (Harnowo, 2015). According to Sharif, Kamal and Irani (2014), information systems play the role of instigating change within organizations leading to increased responsiveness while decreasing overheads in the supply chain.

Information systems have gained in relevance particularly in contemporary economic environment. It is argued that most organizations have transformed their way of operating leading to intensive competition among industries and even Governments (Sharif *et al.*, 2014). Information systems have therefore been seen as the solution to the support organizations require in terms of decision making, organizational agility and competitiveness (Vundavilli, Parrapagoudar, Kodali & Benguluri, 2012). The need to evaluate information systems as used in supply chains therefore becomes ever more necessary. Sharif, Irani and Weerakkody (2010) note that evaluation of information systems in enterprises is a process that ensures that decisions are made compatible with the organization's defined risks, benefits and costs, and also highlights backlash that arise from investment in information systems.

Evidence shows that information systems form a substantial proportion of organizations financial investment and therefore require cautious evaluation and management (Sharif, Kamal and Irani, 2014; Irani, 2010). Despite the substantial investment required for information systems, it is reported that the way they are implemented influences how organizations operate and more importantly, impacts strategies and tactics adopted as well as operational decisions arrived at (Raymond, Crotean & Bergeron, 2011).

In supply chain management, information systems have been intertwined in what is then referred to as supply chain information technology (SCIT) with a view to leveraging technology (Murphy, 2014). Consequently, through the use of SCIT, organizations are able to have a seamless sharing of information. Prajogo and Olhager (2012) aver that use of information systems embedded in SCIT allows organizations to share vital information that enhances their interaction. Ergun and Murat (2012) citing the work of Mikko, Laukkanen, Sarpola, & Kemppainen (2007) identify supply chain planning, transaction processing, and collaboration as among the key roles information systems play in the supply chain. Linton (n.d) concurs that information systems are important in the supply chain where they facilitate knowledge sharing that essentially gives management and project teams information relevant to decision making.

Linton identifies five key roles that information systems play in supply chain management. The first role is transaction processing. Use of transaction processing systems (TPS) enables the collection, storage, modification and retrieval of data transactions; functions that bring rapid processing, reliability, controlled access, and consistency into the supply chain (Ilmudeen & Ismail, 2011). Order processing systems that fall under this category for instance enables input of customer's order details to be handled from a central database and then, send to various departments such as manufacturing, customer service and accounting. Customer management is the second role identified that is associated with information systems in the supply chain. Faed (2013) argues that customers' preferences and purchasing patterns can easily be captured using customer relationship management systems. Data held within these systems such as that related to service requests, sales, inquiries and sales record provide avenues for creation of personalized approach to individual customers.

Decision support is also identified as a major role that information systems play in the supply chain. According to Seuring (2013), installation of decision support information systems allows the management access to marketing, financial and operational data relevant for faster decision making. Decision support information

systems enables information on financial records, sales, manufacturing and inventory as well as market research to be stored together, making it easier to retrieve it for future decision making (Seuring, 2013). Management of the supply chain is the fourth role associated with information systems in the supply chain. Kim, Lee, Chung and Lee (2015) contend that supply chain management systems have potential to improve efficiency and control costs by enabling organizations to share information through secure networks. They argue that supply chain members are provided with information pertaining to sales and production requirements, and are therefore able to plan their operations efficiently. Moreover, supply chain members are updated on the dynamism in the market conditions so that they can put in place contingent measures to counter competition.

The fifth role that information systems are reported to play in the supply chain is that of service support. De Carmago and Charbel (2017) contend that service information relating to customer service records, and technical information on equipments and data bases is brought together in a central data base from which field service teams easily access information required to do their work efficiently. They are therefore harnessed with the right platforms for doing their work.

Mundia, Langat and Lelegwe (2015) citing the views of Motivani and others agree that supply chains require automation which is critical to their management. Existence of software for supply chain management that can help reduce production, inventory, transportation and purchase costs and also reduce lead time is therefore an added advantage in achieving the same. Buxmann *et al.* (as cited in Mundia, Langat, and Lelegwe, 2015, p. 536) notes that although several communication technologies are used across companies, Electronic Data Exchange (EDI) and Enterprise Resource Planning (ERP) are most commonly used.

ERP is noted to support functions that are inbound oriented. Nemati and Mangaladurai (2013) argue that when used by organizations, ERP improves the supply chain; coordinates executions of supply chain activities thereby minimizing delays; improves inventory management and by consequence reduces operational costs; and also enhances partner collaboration. In support of the views of Nemati and

(Mundia *et al*, 2015) contend that the ERP system ensures that the organization's operations are coordinated and that the organization's relationship with suppliers and customers is enhanced. However caution that for the ERP systems to be successful, they need to be defined in a clear and specific way that is compatible with the specific industry sector. Besides, top management should be totally committed to foster the requisite organizational change that supports ERP system. Fui-Hoonah and Delgado further caution that ERP projects should be implemented and managed in a manner such that no mismatch exists between the business and the developed ERP systems.

EDI as the use of transaction sets to occasion exchange of data between computer systems (Mundia,2015).The argument is that use of EDI not only reduces administration costs while overseeing improved data management accuracy and speed but, also injects speed, flexibility, security and accuracy in sending and receiving standardized business communication among organizations. Data interchange identifies communication through direct application to application; use of the electronic medium for transmission, electronic mailboxes for collection and storage; and internationally agreed structure and format standards as among the elements that put EDI at the fore front of information systems. Mundia, Langat and Lelegwe (2015) however caution that the success of EDI is dependent upon managements understanding of its importance and committed support to oversee its implementation. Moreover, Keah *et al*. (2010) points to organizations partnership attributes such as trust, interdependence, and commitment as being responsible for the performance of EDI. They are noted to enhance diversity, integration and utilization.

The review clearly shows that information systems are critical to the success of supply chain operations. They play key roles in transactions, customer management, decision making, overall management of the supply chain and offer support to services. Having established information systems can therefore be a key driver of supply chains, the researcher therefore conceptualized information systems as

variables with great potential to impact on organizational performance, and therefore worth investigating.

2.4.2 Inventory Management

The management of materials in organizations cannot be achieved without reference to inventory, also referred to as stock. Inventory and its management remains a central theme in discourse on managing materials. Vrat (2014) in general terms defines inventory as the stock of goods physically stored to meet expected demand. However, from a material management axis, Vrat (2014) views inventory as resources that though having economic value for use remain idle. Vrat argues that it is sensible to set aside some physical stock that can take care of anticipated demands rather than cause delays in operations for lack of relevant materials, necessitating inventory in most organizations.

Kontus (2014) posits that inventory management is a key organizational function that helps in the development of policies aimed at optimal investment in inventory. Consequently, optimal inventory management can lead to maximization of liquidity and risk. Chambers and Lacey (2011) observe that inventory management seeks to strike a balance between benefits that accrue from holding inventory and costs of doing the same. Consequently, inventory management as noted by chambers and Lacey is a process designed to maximize the net benefits of the inventory, yet at the same time minimize expenses that go to it.

Vrat (2014) notes that keeping inventory in the organization is a process that attracts opportunity costs, which are also referred to as carrying or holding costs. Vrat argues that the fact that keeping inventory incurs costs leads to the paradox stating that 'though inventory is needed, inventory is not desirable to have'. The essence then is that inventory management is an ever more challenging task. Kontus (2014) argues that insurance, storage and spoilage costs are functions of higher inventory levels. Consequently, management ought to carry out appraisals of adequacy of inventory levels for purposes of overseeing the lowering of costs, minimization of inventory and improvement in profitability. Inventory management is therefore seen as a sure

way of ensuring that inventories required for sustenance of operations are available so long as ordering and carrying costs are held to the lowest level possible (Kontus, 2014).

Recognition of the fact that though it is important to maintain optimal levels of inventory, it is usually not easy has led to the development of models capable of determining optimal levels of inventory to be held (Lwiki, Ojera, Mugenda & Mugenda 2013). Such models are reported to be either deterministic or probabilistic whereby deterministic models are built on the premise that demand and replenishment of inventories are certain to occur. Probabilistic models, though rarely used postulate that demand patterns and inventory lead times have some degree of uncertainty (Akçay, 2013). The three deterministic models namely: Economic Order Quantity (EOQ) model; ABC analysis and inventory Turn over Ratio is however the ones most commonly used.

Okwabi (2014) views the Economic Order Quantity (EOQ) as a model capable of finding the order quantity that minimizes the total cost from a deterministic perspective. In Okwabi's definition, EOQ is perceived to be answering questions related to how often materials should be bought? When they should be bought? And what stock should be reserved? Arslan and Metin (2013) in recognition of the influence of social and environmental factors in material management revised the EOQ model with a view of incorporating the environment and social factors. Muhammed and Omar (2012) view the EOQ as a valuable tool for determining the level of inventory to keep in the organization. Noting that the EOQ refers to the number of units organizations require to add to existing inventory so as to minimize shortage, holding and order costs, Muhammad and Omar contend that EOQ can therefore be used in the decisions of how many items to order and how often and at what costs which, helps optimize expenditure.

Ordering and carrying costs are reportedly central in decisions as to what the EOQ level ought to be. It is argued that ordering and carrying costs relate inversely with each other such that an increase in holding inventory costs results in a decrease in ordering costs and vice versa (Akçay, 2013). Optimal EOQ is therefore determined at

the point when the aggregate of the two costs is deemed minimal. Ordering, costs results mainly from order placement, requisition, storage, administration, and transportation. On the contrary, carrying costs are a result of insurance, deterioration and obsolescence, warehousing, handling, and administration (Okwabi, 2014).

Ravinder and Misra (2014) point to ABC analysis as a categorization technique that is well established. The technique is noted to use the Pareto Principle in determining the items that should be prioritized in managing an organization's inventory. They argue that the Pareto Principles gives ABC analysis the selective ability based on the logic that given a large number, there exist a 'significant few' and 'insignificant many' and that this holds true for inventories. In essence, the organizations inventories are grouped into three categories A, B and C for which the management efforts are trained on managing items in A. The items in C are given the least priority and those in B are next in priority to those in A (Ravinder & Misra, 2014).

A number of approaches have been proposed under the ABC analysis. The subjective weighting and Rating uses a subjective weighting scheme to score each type of inventory against a given criterion. The different scores are then combined (Kabir, Hasin & Khondokar, 2011). The linear optimization method has also been used to determine the weights (Hadi-Vencheh, 2010). The argument is that inputs needed in the rating and weighting approach are not only subjective and cumbersome to determine but are also inconsistent. The data available in their view, should therefore rather be left to identify the group to be prioritized.

Artificial neural networks (ANN) have also been used in the ABC analysis (Ravinder & Misra, 2014). They base their categorization on four criteria which they identify as demand range, lead time, ordering cost and unit price. Consequently, by considering the values of these criteria as inputs the network is able to categorize the values into A, or B or C. Gulsen and Ozkan (2013) approach ABC analysis from a clustering problem perspective. They argue that inventory items are partitioned into three clusters and thereafter, the ABC categorization is produced. Other classification techniques similar to the ABC analysis principle include; the Fast moving, slow

moving and non moving (FSN); and the Vital, Essential and Desirable (VED) categorizations (Dernani, Gupta & Nigar, 2010).

The other deterministic model of inventory management that features more often in extant literature is the inventory turnover ratio. Khan, Deng and Khan (2016) identify inventory turnover as a criteria that managers and industry use to judge inventory performance. They define inventory turnover as the ratio of the value of goods sold to the value of the average inventory (Khan *et al*, 2016) established that inventory turnover tended to vary within firms with variations in gross margin, capital intensity, and sales surprise. It is argued that comparing a firm's current year's inventory ratio with previous years has the potential to give an indication of behaviour of inventory (Shardeo, 2015). In essence, a high inventory ratio is interpreted to mean high demand for inventory items and hence an indication of fast moving items. The reverse is therefore interpreted to mean the demand is low and hence the turnover ratio is equally low indicating slow moving items. The third scenario is when items have no demand and requiring early disposal and being an indicator of dormant or obsolete items (Shardeo, 2015).

Other than the discussed models, literature highlights other techniques often used to control inventory. Shardeo (2015) identifies the just in time system (JIT) as an approach that eliminates the need to carry large inventories. It is noted that under this system, required materials arrive at the firm or site just when they are about to be used. Outsourcing also features among the approaches intended to control inventory. It is noted that rather than manufacture points in-house, they are bought from other companies (Shardeo, 2015). Computerized inventory control system which is automated to count inventories and to record withdrawals and balances is also used in contemporary business environment. Shardeo observes that the technique controls inventories by easily tracking large inventory items.

There is no doubt from the foregoing review that management of materials remains an important function in the supply chain and attracts a lot of interest from organizations. It therefore becomes necessary to examine closely whether it is among

supply chain functions that determine organizational performance and more importantly, the contribution it makes.

2.4.3 Buyer–Supplier Relationship Management

Customer supplier relationship has been identified as a key factor of supply chain performance (Vieira, Paiva, Finger & Teixeira, 2013). The interdependence between suppliers and buyers is elucidated by Schiele, Calvi and Gibbert (2012a) who argue that suppliers tend to make themselves attractive to customers for purposes of selling products. Similarly, buyers also attempt to appear attractive so as to get the best bargain from the suppliers. Understanding strategic relationships with valued suppliers allows value creation to be maximized in the supply chain. It is contended that when both parties (Suppliers and customers) perceive that the relationship is providing them with value, they are bound to maintain and even improve the relationship (Kamau, 2013).

Effective customer supplier relationship as collaboration between two or more members of supply chain with a view to gaining competitive advantage by among others; making decisions jointly, sharing information, and sharing benefits. Commitment among collaborating partners features significantly as a key element of partner collaboration (Korir, 2015). It is posited that commitment among buyer /supplier relationship represents a belief that the partners are ready to make the necessary efforts to sustain the relationship. Several dimensions are therefore identified as being critical to the maintenance of the customer supplier relationship (Korir, 2015).

Schiele *et al.* (2012a) identify satisfaction as a very important element in the process of decision making among suppliers. On the basis of the social exchange theory (SET), Schiele and friends establish links between the concepts of satisfaction, attractiveness and customer expectations. Consequently, these scholars argue that satisfaction is integrated into social exchange theory using the concept of comparison level. They explain that the concept allows parties to evaluate each other compared to an exchange outcome and possible exchanges with other potential parties. Meeting

the level of expectancy among the supply chain members then constitutes the required outcome of satisfaction.

Supplier development emerges as another potential element that sustains buyer-supplier relationship management. Beddari and Palmqvist (2014) define supplier development as efforts made by customers to increase the supplier's ability to meet the customer's supply needs. (Beddari & Palmqvist, 2014) observe that supplier development could be indirect, in which case customer's investment in supplier development is limited. Or direct, in which human resources and capital are adequately invested in a supplier. Ghijsen and colleagues argue that direct supplier development portends increase in supplier satisfaction owing to the fact that suppliers see the investment as a long term commitment.

Sustainability of buyer-supplier relationships management is also discussed from the attractiveness perspective. According to Huttinger, Schiele and Veldman (2012), customer attractiveness is a function of several factors that include; competitive position, market factors, sociopolitical factors; financial and economic factors, technological factors and more importantly, geographical proximity. In contrast, Mortensen (2012) argues that the value derived from the relationship in the future should constitute attractiveness. The argument posited by Mortensen is that attractiveness should be a constant feature in the entire customer-supplier process owing to its future orientation. In concurring with Mortensen, Ellegaard (2012) emphasizes the need to zero in on future expectations when conducting evaluation of the relationship. This essentially gives attractiveness a future orientation.

Discourse on the concept of attractiveness in the context of buyer– supplier relationship management has continued to elicit diverse views from scholars. It is argued that one cannot only look at attractiveness from the suppliers view, but also from the customers view (Hald, 2012). In essence, Hald sees attractiveness as being interlinked between customer and supplier and not possible to be separated. Hald's views lend credence to findings by Rocca, Caruna and Snehota (2012) that tend to suggest that, customer attraction is usually the property of the individual attracted as opposed to the customer him/herself or the nature of the relationship. In noting that

decisions to purchase are taken from a social point of view, Ellegaard's (2012) arguments bring to the fore value creation, trust and commitment, and relationship factors as determinants' of attractiveness.

It is viewed that value creation as the value either monetary or non monetary that a customer has potential to create for the supplier (Beddari & Palmqvist, 2014). They categorize direct functions into volume, profit and safeguard. Through the customer for instance, the supplier is able to achieve a production volume that enables him/her to operate profitably. By maintaining a positive cash flow to the supplier, it is viewed that the customer is able to satiate the profit function. By giving the supplier control and stability, it is believed that the customer facilitates the safeguard function. According to Walter and Colleagues, the indirect functions of value creation relate to scout, access, innovation and market. The customer gives the technological knowhow to the supplier who obtains the innovation function. Accessibility to new markets reflects the market function, whereas customers scouting and providing critical information reflects the scout function. Provision of third parties who are open and easily reachable is construed to denote the access function (Beddari & Palmqvist, 2014).

Trust and commitment are noted to significantly predict interpersonal relationship. Korir (2015) for instance argues that supply chain performance is a function of the establishment and nurturing of trust among members of the chain. The bottom line is that widespread trust in the supply chain leads to a free flow of knowledge, ideas, services and products resulting in value creation. Beddari and Palmqvist (2014) perceive trust in the realm of the definition by Morgan and Hunt, that trust is the belief that one partner has in the other exchange partner's level of integrity and reliability. Kamau (2013), in paraphrasing Andersen and Kumar notes that longevity of interaction and relationship among supply chain members owes its survival on trust.

Korir (2015) builds on the findings by Kwon to perceive commitment as the belief among partners that an ongoing relationship can go on continuously. According to Beddari and Palmqvist (2014), commitment is the belief by partners that the existing

relationship guarantees indefinite endurance. Trust and commitment are variables that supply chain members require to make decisions when faced with the question of whether to continue with the relationship. Beddari and Palmqvist (2014) citing Ellegaard and Ritter (2007) concur that through commitment the relationship could be maintained and more resources could be dedicated for purposes of developing and strengthening the relationship. In essence therefore trust and commitment mediate the buyer-supplier relationship management.

buyer-supplier relationship management are also required to take cognizance of emotional factors such as pride, anger, love, fear, happiness, sadness, contentment, and shame which are treated as relational factors. It is argued that such factors constitute the irrational aspect of decision making that may not emerge within value creation (Ellegaard & Ritter, as cited in Beddari and Palmqvist, 2014, p. 27). Emotional factors are particularly of interest given that relationships between organizations involve individual employees, who relate on interpersonal levels (Lian & Laung, as cited in Beddari & Palmqvist, 2014, p. 27). The general review of literature on customer – supplier relationship highlights key strengths of such a relationship and associated determinants placing buyer supplier relationship management at a high pedestal in relation to supply chain performance. It was therefore prudent to examine how such a relationship achieved within the supply chain could impact on overall organizational performance.

2.4.4 Transport Management

The world's transportation networks and supply chains are getting more and more complex and intertwined resulting in advancement and sophistication in systems that support them. According to Murray (2017), the need for transport management is informed by the fact that costs associated to transportation can form a large proportion of the expense on overall logistics. Robinson (2015) defines transportation as the movement of products from one end to another along the supply chain. Cristini (n.d) commenting on the role of transportation in supply chain management argues that effective, cost efficient management of logistics requires

that organizations lay a foundation for a responsive, economical transportation network that would lead to reduction in costs and an increase in customer service.

Gitahi and Ogollah (2014) identify transportation as a facet of logistics that represents movement of materials physically along the supply chain. An endeavour to improve services and lower costs has reportedly, occasioned the splitting of the hitherto multiple functions provided by trucking and transport companies (Back, Tinnila & Rajahonska, 2010). Cut rate trucking is therefore postulated as provision of specialized services that lower costs, while packaging, warehousing and final assembly have been viewed in the realm of value addition.

Mwangangi (2016) citing the definition fronted by Kenyon and Meixell (2011) perceive transportation as activities that constitute the shipping of goods and finished products within the supply chain from suppliers to facilities. Laird (2012) avers that transportation forms a major segment of the supply chain owing to its ability to make goods to gain value by virtue of having them relocated to advantageous locations. Atos (2012) concurs that transportation plays a crucial role in the logistics process by linking separated activities.

The need to manage transport is therefore informed by the many activities that have been interlinked. (Mwangangi, 2016) contend that transport management entails the taking care of inventory that has been geographically moved and repositioned through proper plans, controls and decisions. The aegis of the need for the management of transportation is as result of the central role it plays and the costs it attracts. Bowersox and colleagues observe that most of the cost taken by logistics is occupied by transportation and may be in the region of one third to two thirds of the entire amount. Consequently, they argue that transport management impacts directly on efficiency in logistics, reduction in costs of operation, and promotion of quality of services provided.

Bowersox *et al.* (2010) identify speed, cost and consistency as factors fundamental to the performance of transportation. They argue that transport cost which refers to the payment of movement of goods or products from place to place and associated

expenses for maintenance of on transit inventory ought to be at a level that the entire system cost is minimized. Bowersox and colleagues posit that speed, the time needed to conclude a particular movement is directly proportional to the cost associated with the transport in such a way that, the faster the delivery, the higher the cost and vice versa. As a consequence, they advise that modes of transportation be selected on the basis of striking a balance between desired speed and service cost. Transportation consistency is on the other hand considered as the degree to which transportation can be depended upon (Kenyan & Maxell, 2011).

It is argued that in today's era of globalization, the backbone of trade in the world is shouldered by multimodal transportation necessitating the heightening and understanding of elements of multi-modal systems and how to manage them (Lizzette, 2013). Steadieseifi, Dellaert, Nuijten, Van Woensel and Raoufi (2014) note that multimodal transportation provides the requisite advanced platform that can oversee more reliable, flexible, and sustainable transportation. Harris, Wang and Wang (2015) define multimodal transport as use of diverse models such as rail, air, road, and shipping to transport goods. Chao, (2012) contends that multimodal transportation aims at transferring goods through the transport chain in a continuous flow in order to improve financial, time and environmental efficiency.

Several ICT applications such as fuel recording systems, tracking systems, and supply chain planning and management systems are reportedly being used in road transport (Perego, Perotti & Maniaracina, 2011) to achieve efficiency in operations involving road freight. ICT is therefore postulated to possess great potential to effect efficiency, reliability and effectiveness in the operations and management of multimodal freight transportation (Kengpol, Meethom & Tuominen, 2012). Evidence shows that the diverse range of ICT applications available to support multimodal transport are often categorized into freight resource management systems and applications, freight and fleet tracking management systems and applications, and terminal and port information and communication systems and applications (Harris *et al.*, 2015).

According to Harris *et al.* (2015), freight resource management systems and applications potentially improves efficiency in operations, route planning, use of available infrastructure for transport; customer satisfaction; and optimizes vehicles and hence reduces overall costs. Choi (2012) observes that Terminal and Port information and communication systems and applications serve functions such as the reduction in time required for loading and unloading by utilizing terminal operations systems that are advanced; improvement in the use of existing intermodal infrastructure. Achievement of seamless transfers of cargo, cost reduction, and improvement of customer services and therefore results in an increase in their satisfaction.

Freight and fleet tracking and management systems and applications are credited with among other benefits; monitoring and management of both vehicles and cargo while at the same time availing real time information; improving use of the existing infrastructure for intermodal terminal; provision of real time information on cargo handling as a result of better communication; improving safety and security; and reduction in inventory as a result of shorter lead time (SMART-CM, 2011). On the basis of e-FREIGHT (2011), integrated operational information platform place accelerates exchange of data and information among members of the transport chain; and also allows interested parties such as customs to interact with operators on documentation related to transportation.

Despite the benefits such as improved performance, increased visibility and communication; and reduced costs that accrue to firms as a result of the ICT applications, several barriers have been highlighted in relation to adoption of these applications. Literature identifies user-related, policy related and technology related barriers (Harris *et al.*, 2015). Citing various scholars, Harris and colleagues identify user-related barriers twchich includes company size, for which small and medium enterprises often face human resource, financial, and ICT expertise constraints and may not afford required ICT solutions as would large ones. Moreover operation-related issues such as qualified personnel, ICT specialists and skill shortage that pertain to human capital tend to bar adoption of ICT applications as expected (Perego

et al., 2011). Management capability is also reported as an operations related barrier that impacts on perceptions to adoption of ICT (KOMODA, 2009).

Technology issues are far and wide and have potential to interfere with adoption of ICT. The guide to business, DISCWISE, (2012) identifies issues such as ICT integration, security and data protection, interoperability of systems, and standardization as constraints to full use of ICT. Harris *et al.* (2015) argue that lack of homogeneity in ICT standards tends to impact on system development for both multimodal and unimodal operations. Transport systems no doubt contribute significantly to the success of supply chains through their ability to improve efficiency, improve services to customers and also reduce overall operational costs. Considering that several barriers exist that inhibit adoption of ICT which provides the framework upon which such systems operate, it became necessary to examine the effect transport management as a facet of supply chains could have on overall organization performance.

2.4.5 Warehouse Management

Warehousing is identified as another key function within the logistics process that requires keen interest. Bartholdi and Hackman as cited in Ramaa, Subramanya and Rangaswamy (2012) define a warehouse as a facility within the supply chain often used for product consolidation with the aim of reducing cost of transportation and achieving economies of scale in the process of manufacturing or that of purchasing. Gong and De Koster (as cited in Ramaa *et al.*, 2012) argue that warehousing is an operation through which organizations can gain competitive advantage by customizing services to customers preferences. Mukolwe and Wanyoike (2015) view warehousing as activities that are involved in ensuring that goods are stored systematically and in an orderly manner for ease of retrieval.

Various warehouses are identified and categorized into distribution centers or production warehouses and also by the roles they play such as distribution, raw materials, work in process, finished goods, value added services, local, and fulfillment warehouses (Ramaa *et al.*, 2012). Typical operations undertaken in

warehouses include; receiving, accumulating and sorting, order picking, put away, internal replenishment and shipping. Bartholdi and Hackman (2011) note that receiving as the first operation consumes close to 10% of operating costs and involves notification of arrival of goods; unloading of the notified goods, counting; identification, and conducting quality control and acceptance sampling. Accepted goods are then receipted.

According to Karasek (2013), put away requires that storage locations be determined such that the information system is able to locate available storage locations. Moreover, there is a need to come up with an efficient pick list. Bartholdi and Hackman (2011) put operational costs required by the put away exercise at 15% of the entire operational costs. Storing operations are noted to involve the actual distribution of goods to the various storage areas, identifying them if not yet identified, assigning the storage bin, and monitoring storage to establish available goods (Bartholdi & Hackman, 2011).

Perhaps the main activity undertaken in warehousing is picking also called retrieval and which according to Bartholdi and Hackman (2011) consumes around 55% of the operational costs. It is reported to consist of paperwork, searching, extracting, and traveling, and may be homogeneous or heterogeneous (Lim, Bahr & Leung, 2013; Xhu, Mukhopadhyay & Kurata, 2012). Homogeneous picking involves use of the whole pallet, while in heterogeneous picking, identification is made on what to pick and from where, as well as the amount to pick. Heterogeneous picking is noted to come with higher costs despite being the more frequent method used for purposes of satisfying customer needs (Lim *et al.* 2013; Xhu, *et al.*, 2012). Other notable operations undertaken during warehousing include; consolidation which is the completion of customers orders in events where they have been picked by many pickers; checking to ensure that orders are complete and accurate; packing complete orders in readiness for transportations; and then shipping to respective destinations (Karasek, 2013).

As a result of globalization, warehousing is reported to have been facing a variety of challenges such as complexity in supply chain, changes in customer tastes and

demands, dynamism in technology, and globalized operations (Ramaa, *et al.*, 2012). The resultant has been that many organizations have opted to adopt innovative and ICT oriented approaches that includes use of warehouse management systems. Ramaa *et al.* (2012) contend that the essence of a warehouse management system is to streamline operations in the warehouse, by controlling material movement and storage and also controlling transactions associated with picking, receiving, put away and shipping. As a database driven application, Ramaa and colleagues posit that a warehouse management system has the potentiality to improve warehouse efficiency through direction of cut ways and maintenance of accurate inventory. Moreover, the system provides information on bin utilization status in real time thereby optimizing stock. Warehouse management system is noted to use the Audio ID Data Capture (AIDC) technology that includes but not limited to; barcode scanners, wireless LANs, mobile computers, and Radio-frequency identification (RFID) for purposes of efficient monitoring of the flow of products.

Faber, Nynke, De Koster and Rene as cited by Ramaa *et al.* (2012) distinguish three kinds of warehousing management systems often employed in supply chain management. The first system, the Basic WMS is noted to be simple and mainly focuses on through put. It has the ability of only supporting stock and location control. According to Faber and colleagues, the second system is the Advanced WMS which besides the features contained in the Basic WMS has the ability to structure resources and activities in a manner that the flow of goods is synchronized. It is mainly keen on analysis of stock and capacity as well as through put. Faber *et al.* (as cited in Ramaa *et al.*, 2012) further distinguish complex WMS that optimizes the warehouse. It also offers value addition in terms of logistics planning, clock to dock and transportation.

The review on warehousing clearly underscores the ability of warehouse management to achieve efficiencies in terms of reduced travel times, monitoring picking and locations for storage. This however, does not show how warehouse management translates into overall performance. The desire to establish direct

influence that warehousing may have on organizational performance therefore informed the inclusion of warehouse management as a key construct.

2.4.6 Organizational Performance

Organizational performance remains a central theme in extant literature focusing on the Kenyan context. Scholars continue to ventilate on various factors that inform performance in diverse organizations. Awino (2015) for instance focuses on examining the role organizational structure plays in the performance of large firms in the manufacturing sector in Kenya. Her study uses the cross-sectional survey of large manufacturing firms to show that non-financial measures such as customer satisfaction, internal firm processes and firm image influences performance among large manufacturing firms. On the other hand, Shisia, Sang, Matoke and Omwario (2014) contend that strategic innovation has potential to impact positively on the performance of public universities in Kenya.

The influence of human capital on organizational performance has also been investigated. Odhion'g and Omolo (2015) focused on analyzing the effect the investment in human capital has on organizational performance from a pharmaceutical perspective. Using the inferential tests of association, the study revealed that organizational performance was associated with investment in quality, relevance, and reliability in the human capital. Kinyua-Njuguna, Munyoki and Kibera (2014) while focusing on internal organizational environment in the context of community-based organizations specializing in HIV and AIDS, established that the organization's internal environment tends to impact on relevance, efficiency and effectiveness of organizations.

Potential factors that impact on organizational performance have also received attention from a corporate governance perspective. Mbalwa, Kombo, Chepkoech, Koech and Shavulimo (2014) assessed the effect of corporate governance in Sugar manufacturing firms on their performance. The study used manufacturing firms drawn from Western Kenya and correlation analysis to show that corporate governance practices have positive correlations with organizational performance.

Specific practices that come to focus here include characteristics of the board; top management, and stakeholder communication. Kitonga Bichanga and Muema (2016) identify strategic leadership variables such as human capital, ethical practices, and strategic direction as relating positively with organizational performance in the case of the not for profit organizations.

On the other hand, Kariuki and Murimi (2015) investigated employee empowerment and how it impacts on organizational performance. The study explored the case Tata chemicals in Magadi Kenya and found out that employee empowerment through information sharing and training tended to have a moderate impact on organizational performance. Christopher (2005 as cited in Chimwani, Iravo, & Tirimba, 2014) contends that in order for any responsive organization to meet its desired procurement goals such as the transformation of: functions to processes; inventory to information; products to customers; profit to performance and transactions to relations, there is need to continuously monitor the key measures of procurement performance. It is argued that despite the wide array of measures that can be deployed to measure procurement performance, the success of the measurement relies basically on a few indicators which can be determined by use of the balanced score card (Chimwani *et al.*, 2014). The balanced scorecard takes cognizance of the procurement goals which are often a mix of the organizations internal measures for managing resource utilization and total quality measures expected by customers.

Moreover, observations have been made to the effect that adherence to supply chain practices has potential to reduce operational costs and result in outputs that match organizational goals (Muma *et al.*, 2014; Osuga *et al.*, 2015). More evidence on the importance of supply chain practices is attributed to Kimotho (2014) who argues that satisfactory procurement performance has a direct impact on firm profitability, supplies, quality and competitiveness. There is no doubt therefore that use of appropriate supply chain practices remains the panacea to challenges facing the textile industry in Kenya. However, in the event of scanty evidence from a textile industry perspective, the present study yearned to identify supply chain determinants that could best predict firm performance in this important sector.

2.5 Empirical Review

This section focuses on empirical evidence existing in literature focusing on how each of the supply chain determinants namely: supply chain information systems, inventory management, customer-supplier relationship, transport management, and warehouse management impacts organizational performance in various sectors. Choice of these determinants was informed by assertions of Shahzadi, Amin and Chaudhery (2013) indicating that logistical drivers such as inventory, transport and warehousing; and cross-functional drivers that include information and sourcing are major drivers of supply chain performance.

2.5.1 Supply Chain Information Systems

The central role supply chain Information systems plays in organizational performance has not escaped supply chain management scholars. Several studies have been conducted globally interrogating key supply chain information systems and their impacts on organizational performance. Qrunfleh Tarafdar (2012) for instance analyzed the impacts information systems strategy had on the performance of supply chains and by consequence on firm performance. Basing on the premise that information systems aligned to an organization's supply chain facilitates processes within the chain, the study utilized structural equation modeling to validate at test conjectures. The study revealed that use of the information systems strategy enhanced the hypothesized relationship between lean supply chain and supply chain performance. The study went on to show that supply chain performance related positively with organizational performance.

In another study, Gilaninia, Monsarian, Tayebi *et al.* (2011) examined the impact of technology application on supply chain performance and in essence organizational performance. Buoyed by the understanding, that information sharing should be considered as a crucial element of the supply chain process they used the descriptive research to establish that inadequacy of information systems may lead to lack of information accuracy resulting in inefficiency in supply chain operations and hence poor organizational performance.

Interest in the role of information systems in organizational was also analyzed by Kashani and Baharmast (2017). Motivated by the fact that information is cited as an important asset to organizations, the study used the smart PLS software to examine how information systems integrated in the supply chain affects firm performance. They were able to establish that agile supply chain is significant predictors of supply chain performance, which is itself a significant predictor of firm performance. In addition, they also establish that information systems moderate the relationship between supply chain performance and firm performance. The essence from findings by Kashani and Baharmast (2017) is that information systems have an indirect influence on organizational performance.

Qunfleh (2010) assessed the impacts of information systems aligned with supply chains on the performance of the supply chain, and that of the organization. The argument was that most of the strategies adopted for supply chain management would ideally require integration of appropriate systems. The study adopted structural Equation modeling (SEM) to first validate the measurement model and then to establish path coefficients arising from the structural model. The study established that integration of information systems goes a long way in enhancing implementation of practices employed in supply chain management.

In a more recent study, Modgil and Sharma (2017) used strategic information systems, operational information systems, and infrastructural information systems to examine the tri-linkage between information systems, management of supply chain and operational performance. The study established correlations between the three types of information systems and supply chain practices and between supply chain practices and organizational performance. The conclusion was that the information systems had indirect impacts on organizational performance. The implication is that information systems are able to improve supply chain practices and this tends to influence operational performance.

Al-Nakib Noofal and Hu (2015) assessed the use of management information systems in the effort to boost corporate performance. The motivation of the study was that prior evidence has pointed to the ability of management information

systems to avail information for use in decisions related to corporate performance. The study uses the systematic review of literature to come to the conclusions that management information systems helps organization to remain competitive. Moreover, they enable organizations to improve their operations and overall effectiveness.

Several studies have been conducted in the local context interrogating key supply chain information systems and their impacts on organizational performance. Kibera and Orwa (2016) for instance, conducted a descriptive study seeking to find out implementation of supply chain integration in manufacturing firms. The study revealed that integration of supply chain allows processes to be conducted in a systematic way which in essence cuts down cost and improves efficiency. The study recognized the need for further research that could incorporate more systems and look at other factors that may inform integration of supply chains.

Mundia, Langat and Lelegwe (2015) analyzed the effect integration of information system has on management of upstream supply chain among supermarkets operating within Nakuru town. The principal tool for data collection was the questionnaire while data was analyzed using the multiple regressions model. The study established that whereas the Enterprise Resource Planning (ERP) system had no statistically significant effect on management of upstream supply chain, the Electronic Data Interchange (EDI) system had a significant and positive effect on management of upstream supply chain.

Arende (2015) explored effects technology adoption has on the process of procurement at the Maritime Authority in Mombasa. The study used a sample of 50 respondents from a targeted population of 225 individuals. Data was analyzed by use of mainly the descriptive statistics and concluded that technology adoption was cost efficient and improved quality of services. Wasike, Ogolla and Mburu (2014) on the other hand, examined the role of competence in information systems on the agility of supply chain in the service industry. IT service competence was found to have a direct impact on supply chain agility as well as on service management skills.

Mbaka (2017) analyzed the influence IFMIS has on the effectiveness of supply chains in county governments. The study found out that use of Electronic Document and Recording Management System (EDRMS) improved the processes of access to information, documents tracking and retrieval. Moreover, the study revealed that use of the e-purchasing component tended to facilitate ease and faster processing of logistics associated with procurement. Kariuki and Shale (2015) found out that the Vendor management integration (VMI) enhances the ability to be competitive among super markets by cutting down cost, improving customer-supplier relationships, and improving information quality.

Kiggira, Mwirigi and Noor (2015) examined the role Electronic Data Interchange plays in the performance of supply chain in cargo distribution management. Using a sample of 35 respondents from the targeted 167 individuals, the study identified EDI as being central in the management of cargo distribution at the port of Mombasa. In another study, Karimi and Namusonge (2014) while focusing on the role information technology plays in warehouse management used a sample of 50 respondents from a target population of 930 individuals. They established that information technology through Enterprise Resource Planning (ERP) impacts positively on service speed and accuracy of transactions at the stores.

Momanyi and Sanewu (2014) examined the impact of information communication technology among Ferry services in Kenya. Using questionnaires and a sample of 60 out of 220 respondents, the study identified operational efficiency, access to information and accuracy, as facets of organizational performance that benefit significantly from the use of technology. Kimechwa (2015) examined the impact supply chain management practices have on the performance of the post bank in Kenya. Using a series of inferential statistics that included chi-square and t-test, the study identified ICT as playing a major role in the performance of the bank, through data transaction and display modes.

It is apparent that information systems as components of information technology have played a significant role in supply chain management and resulted in the performance of many companies in diverse sectors. It is notable though that none of

the studies reviewed focused on the textile sector. Such lack of sufficient evidence in textile industry with regards to the utility of supply chain information systems raised pertinent questions that formed a key focus for this study.

2.5.2 Inventory Management

Inventory management is another supply chain element that features prominently in empirical literature in relation to organizational performance. Several studies conducted across the world tend to show that organization performance measured using a variety of indicators is a function of inventory management. In making the assumption that strategies used by organizations and possible relationships tend to vary with life cycle, Elsayed and Waliba (2016) reexamined the association between inventory management and organizational performance, approaching from a life cycle perspective. The study used econometrics to establish that the ratio of inventory to sales had a negative effect on organizational performance returning the initial and maturity stages of growth. However, during the rapid or revival stage, the effect of the inventory to sales ratio was found to affect organizational performance positively. Elsayed and Waliba (2016) therefore posited that perspectives complete several view points regarding the impact inventory management may have on firm performance.

A study conducted in Nigeria (Ogbo, one & Ukpere, 2014) examined how organizational performance was impacted upon by putting in place effective inventory control management. These scholars relied on the chi-square contingency test to find that inventory management positively affected organizational performance in among other functionalities, material storage and retrieval, reduced operational costs; and effectiveness in sales. Moreover, the study established that techniques used to enhance management of inventory geared towards customer related issues and associated operational feasibility, correlated with techniques adopted to ensure cost effectiveness on return in investments.

Nsikan, Etim and Ime (2015) analyzed the influence of practices used to manage inventory on operational performance of firms specializing on flour milling in

Nigeria. Motivated by a desire to establish whether or not use of different inventory management strategies affected capacity utilization. The study found out that whereas large manufacturing firms tended to settle on specific strategies for inventory management, medium sized firms tended to choose strategies from the scientific models. The study further established that choice of strategy was based on customer demand, industry practices, and production capacity. In addition, the study revealed that use of the scientific oriented inventory approaches tended to improve capacity utilization efficiency. However, use of unscientific oriented approaches had minimal impacts.

In Ghana, Kwadwo (2015) chose to change tune and investigate the impact of efficient inventory management on firm profitability would in ultimately measure firms performance. Kwadwo used data gathered over the period 2004 to 2014 from the stock exchange of Ghana. Analysis of the data gathered revealed that inventory management directed towards raw materials positively and significantly influences profitability of the firm in question.

Mugarura (2013) investigated the impact inventory management has on the performance of organizations from the private sector in Uganda. Using a mix of qualitative and quantitative techniques, Mugarura arrived at the conclusion that; integrated system, over stocking of fast moving brands, use of points required for inventory, recording, and sequencing inventories in respect to importance were among the common techniques used at Coca-cola company to handle materials. The study further established that there existed a positive relationship between inventory management and company performance. The study however pointed out opportunity costs, labour turnover and theft, administration costs; and loss in inventory as the major challenges inhibiting efficient management of inventory at the company.

A number of studies on the role of prudent inventory management in organizational performance have also been highlighted from the Kenyan perspective. Mogere, Oloko and Okibo (2013) for instance, conducted a case study on Gianchore tea factory to assess how inventory control systems affect operational performance in the tea industry. Using a structured questionnaire to collect data and regression analysis,

the study found out that use of material requirement planning, distribution planning, and vendor managed inventory had a positive influence on operations efficiency and by extension on organizational performance.

Lwiki, Ojera, Mugenda and Wachira (2013) examined how inventory management practices used in the sugar manufacturing firms impact on those firms financial performance. The study used both primary data and secondary data. Correlation analysis results revealed that inventory management impacted positively with both return on sales and return on equity

Onchoke and Wanyoike (2016) analyzed the influence that inventory control practices used Agrichemical distributors operating in Nakuru Central Sub-county have on their procurement performance. The study used self-administered questionnaires that were dropped and picked. Regression analysis results revealed that inventory auditing, inventory security practices, and computerized inventory control positively and significantly influenced procurement performance.

Mwangi and Nyambura (2015) examined the role inventory management plays in the performance of companies engaged in food processing. Using the descriptive research design and multiple regression analysis, the study identified production maintenance, cost control, record reduced loss, and continuous supply as key elements of inventory management that play an important role in the performance of the food processing companies.

Wangari and Kagiri (2015) investigated the influence of practices used in inventory management at Safaricom Kenya Ltd on its competitiveness. Data was collected using drop and pick questionnaires. Regression analysis results revealed that inventory investment, inventory shrinkage and inventory turnover were significant predictors of competitiveness in Safaricom Ltd and by extension on organizational competitiveness. On the other hand, Ngei and Kihara (2017) sought to find out how inventory management systems used in firms that manufacture Gas in Nairobi City County influence performance of those firms. The study used both primary and secondary data, and was analyzed using multiple regressions. Results revealed that

Vendor Managed Inventory (VMI), Enterprise Resource Planning (ERP), Radio Frequency Identification (RFID) and e-procurement significantly predicted performance of gas firms.

Mukopi and Iravo (2015) analyzed effects of inventory management on performance from a sugar sector perspective. The study used 30 procurement personnel drawn from a target population of 100 personnel in Sugar firms in Western Kenya. Using ANOVA the study established that strategic supplier partnership; learn inventory systems; legal policies; and information technology related strongly with inventory management and hence firm performance.

Kitheka and Ondiek (2014) assessed how automation in the management of inventory impacts on performance of super markets operating in Western Kenya. The study used a descriptive survey design and targeted supermarkets operating in Kisumu, Kakamega and Bungoma towns. Regression analysis results revealed that automation of inventory management had a direct linear impact on performance of the supermarkets. Kimaiyo and Ochiri (2014) examined the role inventory management in new Kenya cooperative creameries plays on its performance. The study drew a sample of 83 respondents from a target population of 500 individuals. Using the descriptive research design, the study established that inventory management by way of holding stocks and ordering costs tended to increase performance of the firm. The utility of inventory control in supply chain management appears to be felt across a diversity of sectors in Kenya. No literature however exists showing how inventory management for instance directly impacts on the performance of textile firms in Kenya.

The utility of inventory control in supply chain management appears to be felt across a diversity of sectors in Kenya. No literature however exists showing how inventory management for instance directly impacts on the performance of textile firms in Kenya. In the absence of such evidence, the following postulation was made. Moreover, challenges reported with regards to cost implications for implementing the requisite inventory management systems begs the question of whether inventories in all organizations are as elaborate as could be expected. The researcher was therefore

compelled to find out how inventory management as a supply chain determinant affects the performance of textile firms.

Wauna and Obwogi (2015) assessed the effects of procedures of inventory management used in Kengen on the performance of the company. The study was motivated by literature that has pointed towards increase in organizational performance occasioned by prudent inventory management. The study revealed that materials were classified in terms of rate of use as; fast moving, slow moving and non moving. Inventory was also classified in terms of importance. The study also revealed that materials were stored according their respective groups, and using the First in first out system. Wauna and Obwogi further established that storage, coding and inspection were significant predictors of the performance of the firm.

Karanja, Aiyabei, Maroko and Ngugi (2012) examined the influence vendor inventory management had on the performance of retail outlets in Kenya. They were inspired by an understanding that continuous replenishment has been known to foster collaboration and could therefore boost retail outlets. Using a descriptive study, the study concluded that organizational performance was a function of vendor managed inventory, which itself was a function of economic order quantity. The implication was that efficient implementation of vendor inventory management should no doubt lead to improved performance among the retail outlets.

Jefwa and Owuor (2015) analyzed the effect of inventory management system on the performance of Grain Bulk handlers limited. Like many other studies before them, Jefwa and Owuor found out that the inventory management system positively and significantly affects performance of Grain Bulk Handlers Limited. The implication was therefore that prudent management of inventory using the management system could influence accountability, cost, speed and control in the firm.

2.5.3 Buyer–supplier Relationship Management

Buyer-supplier relationship management is another supply chain determinant of performance that has received a lot of interest among scholars all over the world.

Azeem and Ahmed (2015) examined the role buyer – supplier relationship management plays in the performance of beverage organizations in Pakistan. The essence was to underscore specific tenets of buyer supplier relationship management that could impact on organizational performance using the descriptive approach. The study concluded that attributes such as trust, communication, cooperative and commitment embedded in buyer-supplier relationship were key predictors of organizational performance. Consequently the desire should not only be to have good buyer supplier relationships but rather relationships loaded with these kinds of attributes.

Mohamad, Othman, Jabar, Mayid and Kamarudin (2014) analyzed the impact customer relationship management has on the performance of small and medium enterprises in Malaysia. The study was motivated by the fact that buyer relationship management is becoming a central strategy in organizations desire for growth. The study concluded that buyer supplier relationships impacted positively on the performance of the enterprises in question.

Ullah (2012) examined the role trust and in essence buyer – supplier relationship management plays in organizational performance. The study took cognizance of the understanding that trust is essential for strong buyer-supplier relationship. Using correlations and regression, the study demonstrated that communication takes face to face, and good treatment of the supplier were positive and significant predictors of trust. Moreover, trust was found to positively influence supplier investment in customer's needs. The study further revealed that the stronger buyer –supplier relationship, the better the supplier performance and subsequently the higher the organizational performance. In essence therefore, when organizations invest in trust along the supply chain, they potentially raise chances of performing highly.

Vieira, Paiva, Finger and Teixeira (2013) conducted an empirical analysis of the relationship between trust and supplier buyer. The essence was assessing whether differences in regional orientation with suppliers. Using structural equation modeling, the study revealed that involving suppliers in ensuring quality though taken for granted did not have any relationship with partnership or trust. However,

regional differences were found to have an effect on partnership development within the supply chain.

Kenya has not been left out in studies examining the role customer-supplier relationships play in organizational performance. Ideet and Wanyoike (2014) assessed the role buyer-supplier relationship plays in the performance of supply chains in the Kenyan Energy sector. The study used descriptive research design in conjunction with multiple regressions to show that trust, partnership initiatives, and information sharing were key buyer–supplier relationship indicators that influence performance of Geothermal companies of Kenya Power.

Gumboh and Gichira (2015) examined collaboration barriers in supply chain among Kenyan SMEs. Using a systematic review of literature, the study identified lack of trust, culture and relationship as among barriers to collaboration. On the other hand, Makau and Muturi (2015) conducted a study amongst supermarkets in Kisii with a view to finding out how buyer–supplier relationship affects procurement performance in those supermarkets. The study adopted a descriptive survey design and was conducted in 30 supermarkets. Using descriptive statistics, the study identified commitment, trust, communication and cooperation as key facets of customer-supplier relationship that influence procurement performance.

Wachiuri, Waiganjo and Oballah (2015) investigated the role supplier development plays in organizational performance in the context of the East African Breweries Ltd. The study used a descriptive case design to show that financial support rewards, and firm involvement are crucial buyer–supplier elements that have potential to play a big role in the performance of the brewery. Watiri and Kihara (2017) identified customer-relationship as being central to competitive advantage in the East African Portland Cement company. More significantly, the study revealed that strategic partnership with suppliers enhances joint management of inventories and also motivates collaboration in the design of products.

Nyamasege and Biraori (2015) discussed effects of the management of supplier relationship on effectiveness of supply chains in the public sector in Kenya. Using

questionnaires for data collection and descriptive statistics to analyze data, the study identified management of supplier relationship as a determinant of effectiveness of management of supply chains. Korir (2015) examined the effect buyer–supplier relationship has on procurement performance in super markets. The study identified trust communication, commitment and cooperation as being central to sustainable competitive advantage and hence to procurement performance.

Tangus, Oyugi and Rambo (2015) analyzed how management of supplier relationship in manufacturing firms located in Kisumu County affect performance of those firms. The study employed both descriptive and inferential statistics to show that whereas information sharing had significant effects on performance, supplier segmentation and supplier development had no significant effect on performance. Wairimu and Waiganjo (2015) examined the effect of use of the strategy of customer relationship management on the behaviour of customers in Nairobi Safaricom club. Using the case study design, the study concluded that the CRM strategy had a significant positive effect on the behavior of customers. From the discourse above, it is clear that firms across many sectors have recognized the need for buyer-supplier relationship management for optimal performance. The textile sector is however not featuring in existing literature in terms of the supply chain determinants that drive the sectors performance.

From the discourse above, it is clear that firms across many sectors have recognized the need for buyer-supplier relationship management for optimal performance. The textile sector is however hardly features in this discourse. Besides, evidence suggests that supplier relations *per se* may not influence much but need components such as trust, commitment and cooperation to be effective. The question then is, is there a guarantee that trust, commitment and cooperation can be easily nurtured? The need to establish the effect buyer-supplier relationship management has on organizational performance was therefore motivated by a need to find answers to the question above.

Kosgei and Gitau (2016) analyzed the effect of supplier relationship management on the performance of Kenya Airway Limited. The study was informed by the

understanding that competitive advantage could be secured by effective management of supply chain for which buyer supplier relationship is an important component. Focusing predominantly on trust and commitment in supplier relationships, the study established among other findings, competitive advantage and profitability depends on the level of supplier relationship practiced in the supply chain management, prudent supplier relationship management is a precursor to improvement in organizational performance. The import of the findings is that investment in trust and commitment would no doubt solidify supplier relationship leading to better performance.

Kamau (2013) investigated the influence buyer-supplier relationship on the performance of large manufacturing firms in Kenya. Using a cross sectional survey of manufacturing firms in Nairobi, the study revealed that buyer – supplier relationship significantly influenced organizational performance and that the coefficient of determination between the two variables was 0.723. The conclusion was that variation in buyer –supplier relationship would account for 72.3 percent of variation in organizational performance.

2.5.4 Transport Management

The need for materials movement along a supply chain puts transport management at the core of logistics. A number of studies have consequently been conducted with a view to establishing the influence of proper management of transport on overall performance among organizations. Liberatore and Miller (2016) examined the impact of the performance of out-bond logistics on firm profitability in manufacturing and service oriented firms. The study was informed by the diversity in performance metrics available for use by firms. Using Cluster analysis to develop a taxonomy, the study distinguished four clusters which were named as; inventory investment minimizers; planners and efficient distribution spenders; low cost; low service providers, and heavy distribution spenders respectively.

Akdogana and Durak (2016) compared logistics and marketing performance of logistics companies between Germany and Turkey. The motivation of the study was

globalization and increased activities related to foreign trade observed globally. Measuring logistics companies drawn from Germany and Turkey, the study revealed that there were significant differences between logistics and marketing performance among logistics companies drawn from the two nations.

Locally, a number of studies have equally been conducted with a view of exploring the role of transport management in supply chain management. Kithiia (2015) conducted a study on Maersk Kenya Limited, a logistics firm to examine effects electronic logistics has on the performance of logistics firms. Using a sample of 75 individuals drawn from 107 employees of the firm, the study revealed that e-logistics influenced performance of logistic firms positively.

Muchori (2015) analyzed the effect of congestion in the road traffic on freight logistics efficiency at the port of Mombasa. Building on the infrastructural pressure on the road from Nairobi to Mombasa which has continued to put strain logistics operations at the port, the study employed a descriptive survey design and used a sample size of 150 respondents from a possible 10450 employees. The correlation results revealed that traffic congestion had a positive correlation with transport cost. Consequently, traffic congestion impacted negatively on efficiency of freight logistics.

Mukolwe and Wanyoike (2015) assessed how management practices used in logistics affect operational efficiency in Mumias Sugar Company. Using descriptive and inferential statistics, the study revealed among other findings that transport management and the practices used for physical distribution are synonymous with the flow of raw materials and goods that is cost effective which impacts positively on operational efficiency.

Mwangangi (2016) examined the influence logistic management has on performance of manufacturing firms. The study used both primary and secondary data drawn from employees of the firms and published and unpublished records. Using multiple regressions analysis, the study revealed that transport management by use of transport management systems was a significant predictor of firm performance.

Gitahi and Ogollah (2014) investigated how practices used to manage fleet influence service delivery to refugees under the UNHCR Kenya programme. The study builds on the premise that transportation is central to logistics. The study used the descriptive research design and targeted 390 employees. From the sample of 117 who participated in the study, it was concluded that the rate of fuel consumption on tracking, fuel monitoring, fuel sourcing, fuel allocation on a day to day basis, and the rate at which fuel usage is monitored influence delivery of services to refugees in the UNHCR programme in Kenya.

Ndubi, Iravo and Ochiri (2016) examined the effect variability in lead times has on the performance of inbound logistics at Safaricom Limited. Using linear regression model, the study identified lead times in terms of production, shipping, the TAT time for customs brokerage, and the velocity for inspection of goods as having direct and significant effects on the performance of inbound logistics measured in terms of delivery time, cost and quantity.

Although much literature exists regarding transport and logistics management and its benefits, most studies focus mainly on the logistics component. It is imperative to note that transport is often viewed as a component of logistics and therefore its influence is hardly isolated. Besides, no literature exists showing how transport management for instance directly impacts on the performance of firms in the textile sector. The motivation for the present study was therefore driven by a desire to find out how firms under the textile sector manage transportation and how this impacts on their overall performance.

2.5.5 Warehouse Management

Warehouse management though not featuring so much in existing studies has however received interest in some quotas. Saufudin, Zanuddin, Sauthirasegarana, and Nadarayan (2013) examined the influence of warehouse layout on the efficiency of small and medium enterprise from a management information systems perspective. The study found out that there was a positive and significant correlation between warehousing layout and warehouse efficiency. Similarly warehouse layout correlated

positively and significantly with management information system. In addition, the study revealed that warehouse layout and warehouse management information system were significant predictors of warehouse efficiency and that variations in warehouse layout and warehouse management information system explained 75.8 percent of the variation in warehouse efficiency.

Some studies have also featured in the local context. Mukolwe and Wanyoike (2015) assessed effects that logistics management may have on the efficiency of operations at Mumias Sugar Company. The study identified automation of warehouse management activities as having, potential to enhance required accuracy, operational speed and limit wastage. Wambua, Okibo, Nyang'au and Ondieki (2015) investigated the effect systems used for inventory warehousing in seventh day Adventist institutions has on financial performance. The study was buoyed by the understating that inventory management is a crucial facet of profitability and organizational performance. The study adopted the descriptive research design to show that inventory warehousing system significantly and positively affected financial performance in those institutions.

Karimi and Namusonge (2014) examined the role information technology serves in warehouse management in institutions. The study was informed by the knowledge that efficient management of the warehouse potentially gives retailers a cutting edge. The study adopted a descriptive research design together with descriptive statistics to show that the use of technology has a positive effect on warehouse management. Most studies approach warehousing from an inventory management perspective. There is however need to treat them as different entities on the basis of complexity, control, integration, and solutions.

2.5.6 Organizational Performance

Organizational performance remains a central theme in contemporary literature. Scholars continue to ventilate on various factors that inform performance in diverse organizations. Awino (2015) for instance focuses on examining the role organizational structure plays in the performance of large firms in the manufacturing

sector in Kenya. Her study uses the cross-sectional survey of large manufacturing firms to show that non-financial measures such as customer satisfaction, internal firm processes and firm image influences performance among large manufacturing firms. On the other hand, Shisia, Sang, Matoke and Omwario (2014) contend that strategic innovation has potential to impact positively on the performance of public universities in Kenya.

The influence of human capital on organizational performance has also been investigated. Odhon'g and Omolo (2015) focused on analyzing the effect the investment in human capital has on organizational performance from a pharmaceutical perspective. Using the inferential tests of association, the study revealed that organizational performance was associated with investment in quality, relevance, and reliability in the human capital. Kinyua-Njuguna, Munyoki and Kibera (2014) while focusing on internal organizational environment in the context of community-based organizations specializing in HIV and AIDS, established that the organization's internal environment tends to impact on relevance, efficiency and effectiveness of organizations.

Potential factors that impact on organizational performance have also received attention from a corporate governance perspective. Mbalwa, Kombo, Chepkoech, Koech and Shavulimo (2014) assessed the effect of corporate governance in Sugar manufacturing firms on their performance. The study used manufacturing firms drawn from Western Kenya and correlation analysis to show that corporate governance practices have positive correlations with organizational performance. Specific practices that come to focus here include characteristics of the board; top management, and stakeholder communication. Kitonga Bichanga and Muema (2016) identify strategic leadership variables such as human capital, ethical practices, and strategic direction as relating positively with organizational performance in the case of the not for profit organizations.

On the other hand, Kariuki and Murimi (2015) investigated employee empowerment and how it impacts on organizational performance. The study explored the case Tata chemicals in Magadi Kenya and found out that employee empowerment through information sharing and training tended to have a moderate impact on organizational performance. Christopher (2005 as cited in Chimwani, Iravo, & Tirimba, 2014) contends that in order for any responsive organization to meet its desired procurement goals such as the transformation of: functions to processes; inventory to information; products to customers; profit to performance and transactions to relations, there is need to continuously monitor the key measures of procurement performance. It is argued that despite the wide array of measures that can be deployed to measure procurement performance, the success of the measurement relies basically on a few indicators which can be determined by use of the balanced score card (Chimwani *et al.*, 2014). The balanced scorecard takes cognizance of the procurement goals which are often a mix of the organizations internal measures for managing resource utilization and total quality measures expected by customers.

Moreover, observations have been made to the effect that adherence to supply chain practices has potential to reduce operational costs and result in outputs that match organizational goals (Muma *et al.*, 2014; Osuga *et al.*, 2015). More evidence on the importance of supply chain practices is attributed to Kimotho (2014) who argues that satisfactory procurement performance has a direct impact on firm profitability, supplies, quality and competitiveness. There is no doubt therefore that use of appropriate supply chain practices remains the panacea to challenges facing the textile industry in Kenya. However, in the event of scanty evidence from a textile industry perspective, the present study yearned to identify supply chain determinants that could best predict firm performance in this important sector.

2.5.7 Moderating Effects of Background Characteristics

Demographic variables that include gender, age, experience and socio-economic status have been identified as key buyer and supplier characteristics that have potential to impact organizational performance (Soderlund, as cited in Chin & Tat, 2015, p.37). Rene (2012) posits that the difference in age determines the level of cooperation among employees which in turn informs the level of performance. The argument made is that low age difference leads to high levels of cooperation while high age difference leads to low levels of cooperation.

Gender also continues to feature strongly as a moderator variable in discourse on consumer behaviour, customer satisfaction, marketing loyalty, and mobile banking (Ndubisi, 2006; Riquelme & Rios, 2010; Walsh, Evanschitzky & Wunderlich, 2008). Eagly (as cited in Chin & Tat, 2015, p.37) argues that gender has an influence on leadership and therefore men and women leaders are bound to behave differently.

Hambrik and Mason (as cited in Flanigan, Bishop, Brachle & Winn, 2017, p.7) suggest that experience impacts decision making and therefore by extension, influences organizational performance. Age as a demographic variable has also received substantial attention in literature relating to its potential to impact organizational performance. According to Grimm and Smith (as cited in Flanigan *et al.*, 2017, p.7), age has a direct impact on innovativeness, with younger managers

tending to be more innovative in development of growth oriented strategies. Age has also been found to have a positive correlation with leader generativity. Older managers are reportedly more transformational in leadership compared to younger leaders (Zacher, Rosing, Henning & Freese, 2011).

Another background characteristic that features prominently in discourse on organizational performance is tenure of employment. Schwenk (as cited in Flanigan *et al.*, 2017, p.8) report that tenure has a negative influence on performance. The argument is that employees with long tenure may develop strategy based on outdated information. However, Finkelstein and Hambrick (as cited in Flanigan *et al.*, 2017, p.8) report strong direct relationship between tenure and performance.

Contradictory results regarding the influence of background characteristics also exist with regards to gender. Magoshi and Chang (2009) established that gender diversity impacts positively on quality of employee relationships leading to improved performance. On the contrary, Sakuda (2011) found that gender diversity has a negative impact on the quality of relationship. The implication of the contradictory findings is that background characteristics may or may not moderate relationships involving organizational performance. Indeed, Flanigan *et al.* (2017) found that experience and age do not moderate the relationship between leadership and performance.

2.6 Critique of existing literature relevant to the study

Procurement performance particularly in the public sector remains a central theme in existing literature. Several studies have contributed significantly in shedding light on supply chain management and organizational performance. The positive contributions made by these studies however remain subject to discourse since approaches and designs used may be open to validity issues.

A study conducted by Kibera and Orwa (2016) on implementation of supply chain integration in manufacturing firms, found out that integration of supply chain allows systematic conducting of processes. More specifically, the study pointed towards

cost reduction and improvement in efficiency as positive performance indicators derived from effective implementation of supply chain integration. Although these findings provide a basis for improvements in organizational performance, the sample size of 10% used could not guarantee generalizability of the findings.

Kepher, Shalle and Oduma (2015) in their study focused on the role supplier management plays on procurement performance. The finding showing that 81% of variation in procurement performance in the case of EABL could be explained by supplier integration, supplier collaboration, quality management of the supplier and supplier training is quite informative and appreciated. The present study however wonders how the question of role can be answered by use of regression analysis. Perhaps, the best approach to analyzing role should have been use of principal components factor analysis. Otherwise use of multiple regressions as implied in the proportion of variation stated would possibly require a change in focus.

Mundia, Langat and Lelegwe (2015) analyzed integration of information systems in the management of upstream supply chains in supermarkets. The study findings that EDI had a significant effect on the management of upstream supply chain while ERP did not have any effect are relevant in policy formulation in the retail sector. However, reliance on the questionnaire as the principal tool as the authors did, does not put into consideration the need to triangulate data instruments perhaps for purposes of improving on the reliability of findings. Moreover, the coefficient of determination value ($R\text{-square} = 0.097$) indicates that the predictor variables used by Mundia *et al* (2015) account for only 9.7% of the variation in management of upstream supply chains in supermarkets and were therefore weak determinants in this case. There is need to explore factors that could see an improvement in the coefficient of determination.

Chimwani, Iravo and Tirimba (2014) conducted a study in which the focus was to identify factors that influence the performance of public procurement. They brought on board triangulation of data collection by using the questionnaire, observation and interviews. This is commendable since the idea was to have as more reliable data as possible. They used a conceptual framework which postulated that the factors

identified had direct effects on procurement performance. Whereas their efforts to address the problems are commendable; the present study disagrees with the conceptual framework used. Identifying factors that influence procurement performance is more of qualitative in approach that requires bringing out the factors as opposed to starting with identified constructs. The ideal approach ought to have been theory generation of which factor analysis or discriminant analysis could have been the more ideal data analysis approaches as opposed to the use of multiple regression analysis.

Mbaka (2017) analyzed the influence of IFMIS on the effectiveness of supply chains in County government. The researcher observes that the finding showing that use of IFMIS tended to improve access to information, document tracking, and documents retrieval was vital in facilitating ease and faster processing of operations undertaken by the County Governments. The present study notes that use of correlations and regression may not have been the suitable approach given that on the basis of the coefficient of determination presented in the study by Mbaka (2017), the predictor variable used accounts for a minimal proportion of only 15.7%.

Mogere, Oloko and Okibo (2013) assessed how inventory control systems affect operational performance in the tea industry. The study shed useful information in terms of the importance of material requirement planning, distribution planning, and vendor managed inventory on operational efficiency. Despite these positive results towards organizational performance, the reliability and validity of the instruments are questionable considering that the instruments according to the study were piloted on the same sample used for the study.

Onchoke and Wanyoike (2016) analyzed the influence of inventory control practices used by agrochemical distributors operating in Nakuru Central sub-county on procurement performance. The findings of the study showing that inventory auditing, inventory security practices, and computerized control influence procurement performance positively were quite commendable in the sense that they provide the basis upon which agrochemical distributors could streamline their inventories. The present study however finds issues in the manner in which the questionnaire was

administered. The drop and pick method used cannot guarantee reliable information since the expected study unit may not be the one responding to the items. In addition, the regression model appears weak given that the conceptualized inventory practices accounted for only 32.2% of the variance in procurement performance.

Watiri and Kihara (2017) identified customer relationship as a springboard for competitive advantage in the African Portland Cement Company. This was a key finding that could enable the company to strategize with customer relationship in mind. The finding may however be strengthened if it is made clear how the instrument used to collect data was validated. Customer relationship is sometimes sentimental. The study by Watiri and Kihara (2017) should have considered triangulating data collection that could have seen use of interviews to complement data from the questionnaire.

Muchori (2015) analyzed the effect of road traffic congestion on efficiency in freight logistics. Though the finding showed that there was a positive correlation between traffic congestion and efficiency of freight logistics, the conclusion that traffic congestion had a negative effect on freight logistics may not be justified on the basis of the findings. First and foremost, correlation cannot be used for causation. Secondly.

2.7 Summary

The study reviewed general literature regarding the key concepts of supply chain determinants and organizational performance as well as empirical literature specific to supply chain information systems; inventory management, customer-supplier relationship, transport management, and warehouse management in relation to their effect on firm performance. The review clearly outlined that the noted supply chain determinants are crucial elements of organizational performance. The review however revealed that the textile industry misses in the many studies focusing of supply chain management and firm performance in Kenya. Moreover, the review revealed that the descriptive research design dominates in most studies. The present study therefore sought to fill the gap left by over reliance on the descriptive design by using the mixed methods approach.

2.8 Research Gaps

The review established that a number of factors in the supply chain have been attributed to performance in various organizations ranging from logistics to manufacturing. Several gaps have however been exposed through critique of existing literature. A major gap emerging from literature is the lack of studies on supply chain determinants of performance in the textile industry in Kenya. Though studies have previously focused on manufacturing firms, none has looked at it from the textile perspective.

Another gap identified is over reliance on descriptive survey designs. Most of the studies conducted on supply chain drivers hardly used the explanatory design that is best suited to handle cause-effect relationships such as the one the current study addressed. The review also identified the gap of not mixing approaches as would be expected in the mixed methods design. Most of the studies hardly triangulated data collection approaches and relied mainly on the questionnaire raising issues of reliability (Mbaka, 2017; Watiri & Kihara, 2017; Onchoke & Wanyoike, 2016; Mundia, Langat & Lelegwe, 2015).

A number of studies have been conducted in Kenya focusing particularly on how production costs in the manufacturing industries could be reduced (Kepher, Shalle & Oduma 2015; Munyao, Omulo, Mwithiga & Chepkulei, 2015; Keitany & Riwo-Abudho, 2014). Key among strategies examined by the few studies include: inventory management practices, supplier management, and lean production. Despite these studies highlighting pertinent issues that supply chain management in manufacturing industries ought to address, the textile industry in Kenya is still facing numerous challenges related to its supply chain. A gap therefore exists in literature in relation to the supply chain determinants that influence organizational performance in the context of the textile industry.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the type of research design and the methodology used in the study based on the following sections; target population, sampling frame, sampling and sample size, data collection methods, pilot, data collection procedures, validity and reliability of the instruments, data analysis approaches and presentation. The research adopted a positivism philosophy during the process of conducting the research which comprised the consideration of the study in highly objective manner.

The convergent parallel design (convergent/triangulation design) occurs when the researchers use concurrent timing to implement the quantitative and qualitative studies during the same phase of the research process. The two methods in this design have an equal priority so that both play an equally important role in addressing the research problem. This design keeps the studies independent during the data collection and analysis and then mixes or merges the results during the overall interpretation.

3.2 Research Design

The study adapted the convergent parallel mixed methods design. The convergent parallel design also called convergent/triangulation design occurs when concurrent implementation of the qualitative and quantitative studies is done during the same phase (Creswell & Plano-Clark, 2011). According to Creswell and Plano-Clark, the convergent parallel design allows both the qualitative and quantitative approaches to play complementary roles in addressing the problem at hand. Under this design, the qualitative descriptive method was combined with the explanatory method to first and foremost describe the conceptualized supply chain determinants and performance criteria used by textile firms and, thereafter to try and explain the cause-effect relationship between supply chain determinants and procurement performance. The choice of this design was informed by the desire to make an exhaustive analysis

of the problem by merging qualitative and quantitative data (Creswell, 2013). Moreover, it is argued that research practices tend to lie somewhere on a continuum between quantitative and qualitative approaches (Newman & Benz as cited in Creswell, 2013).

Use of the convergent parallel mixed methods approach was further based on an understanding that there was a need to focus more on the issues at hand as opposed to the approaches to solving the issues (Rossman, & Wilson as cited in Creswell, 2013), and that several approaches needed to be considered for a better understanding and establishing the causal link between supply chain determinants of performance and organizational performance. Under this design, the qualitative and quantitative data were analyzed and presented separately. The findings were then juxtaposed using tables and data matrices as suggested by Hong, Pluye, Bujold and Wassef (2017).

3.3 Target Population

Tabachnick and Fidell (2013) observe that target population refers to that reference population for which the researcher wishes to draw generalizations and from which the study population is drawn. The target population for the present study therefore included the entire set of firms dealing in textile and apparel production in Nairobi City County, focusing mainly on the heads of sections and staff working in sections involved in the entire textile supply chain. The study population was narrowed down to employees and heads of the following sections of textile firms located in Nairobi City County: production/operations management; logistics & transport; and customer service management. Choice of the sections involved in the supply chain as a whole, was informed by the focus of the study on the performance of the firms as a function of supply chain determinants. It was envisaged that staff from these sections would have relevant information that would be used to establish the causal- link between firm performance and existing determinants of supply chain.

Statistics drawn from the Textile and Apparels Report (2016) identified twenty six textile and apparel firms located in Nairobi City County. The total population of staff

in the sections involved in the supply chain of these industries was 1186 segmented as indicated in Table 3.1.

Table 3.1: Study Population

Section	Study Population	Study Population
	Heads of section	No. of Employees
Finance	26	138
Transport & Logistics	26	214
Production/Operations	26	638
Customer service management	26	92
Total	104	1082

3.4 Sampling Frame

The sampling frame for the study was the Textile and Apparels Report (2016) listing the twenty six (26) textile and apparel firms located in Nairobi City County (see appendix...(IV) The sampling units were the four sections namely; finance, transport, production and customer service management.that are involved in the textile supply chain. The study units were the individual employees and heads of those sections.

3.5 Sample Size and Sampling Technique

The sample size was decided upon in recognition of the two sets of study units. To avoid data saturation particularly in the case of qualitative data (Mason, 2010), all the 26 heads of departmental sections were selected. This was consistent with Creswell's assertion that qualitative data typically requires a few cases (Creswell, 2011).

The quantitative aspects of the study required that causal relationships be established between supply chain drivers and procurement performance. The formula suggested

by Getu and Tegbar (2006) was therefore used to find an appropriate sample of employees of respective departments. In this regard, the sample size was calculated as follows:-

$$\text{sample size } n = \frac{Z^2 p(1-p)}{W^2 \left(1 + \frac{\frac{Z^2 p(1-p)}{W^2}}{N} \right)}$$

Where: N =study population which was 1186 in the present case

p = The estimated proportion of successful responses, taken as 50% in the present study. 50% was used since no prior proportions were known and hence a 50/50 scenario was conceived.

W = The margin of error allowed, and set at 5% for the study

Z = The value corresponding to the level of confidence chosen as 95% yielding $Z = 1.96$

$$n = \frac{1.96^2 \times 0.5 \times 0.5}{0.05^2 \left(1 + \frac{1.96^2 \times 0.5 \times 0.5}{\frac{0.05^2}{1186}} \right)}$$

$$= 290.17$$

$$\simeq 290$$

The final sample therefore consisted of 290 staff from the four sections involved in the textile supply chain.

3.5.1 Sampling Techniques

Two sets of study units were required for the purposes of this study. This therefore necessitated use of a combination of sampling techniques. First, the two-stage sampling technique was used to sample the required heads of sections and employees from the targeted sections. In the first stage, the two sets of study units were stratified

into their respective groups' prortionate to their original numbers in the study population. In the second stage, employees were stratified into their respective sections. Simple random sampling was then used to select the section heads and employees to be in the required sample (see Table 3.2).

To select the heads of section, each was assigned a number at random from 001 to 104. Numbers were then generated at random and the head of section whose assigned number matched the generated number was then picked. The process was repeated until all the 25 required heads were identified. A similar procedure was followed in relation to the employee sample but was conducted section-wise.

Table 3.2: Sampling

	Category of Study unit	No in Population	Number in Sample
Stage I	Heads of Section	104	$\frac{104}{1186} \times 290 = 25$
	Employees	1082	$\frac{1082}{1186} \times 290 = 265$
	Total	1186	290
	Section	Population in section	Number in sample
Stage II	Finance	138	$\frac{138}{1082} \times 265 = 34$
	Transport & Logistics	214	$\frac{214}{1082} \times 265 = 52$
	Production/Operations	638	$\frac{638}{1082} \times 265 = 156$
	Procurement/Stores	92	$\frac{92}{1082} \times 265 = 23$
	Total	1082	265

3.6 Research Instruments

Two main instruments were used to collect data for purposes of the present study. An employee questionnaire was designed to collect employees' with regards to supply chain determinants and performance of textile firms. A head of section interview schedule was designed to interrogate views of heads of sections involved in the supply chain for purposes of triangulating employees' views.

3.6.1 Employee questionnaire

The employees' questionnaire was designed specifically to collect information pertaining to employees' views on supply chain determinants and organizational performance as presented in their respective textile firms. The choice of questionnaire for employees was based on its ability to diversify information and also to be used over a large sample size (Kombo & Tromp, 2006). The questionnaire comprised of six sections consistent with the information required on key constructs. Section A focused on information on background characteristics of the employees. Section B sought data on performance of departments within respective textile firms. The next four sections focused on information relating to the key supply chain determinants of performance namely: Supply chain information systems, inventory management, buyer/supplier relationship management, transport management and warehouse management.

The questionnaire was self administered and had closed ended items, with two open ended items consistent with the requirements of the mixed methods design. Responses to closed ended questions were elicited on a 5-point likert scale with 1 signifying strongly disagree, 2-disagree, 3-moderately agree, 4-agree and 5-strongly agree. The researcher enlisted 2 research assistants to hand deliver the questionnaire to sampled respondents and, thereafter collect the completed questionnaires. The research assistants were briefed on what was expected and the need to maintain ethical standards while in the process of delivering and collecting questionnaires.

3.6.2 Head of Sections interview schedule

The second instrument developed for the study was the HOSs interview schedule. The tool was used to gather incisive views from heads of sections involved in the textile supply chain with regards to existing frameworks of supply chain determinants of performance and subsequent performance in terms of reliability, responsiveness, flexibility, cost, and asset management efficiency.

Use of the interview schedule was based on its ability to enable access to in-depth and personal information that could enable intensive investigation (Jamshed, 2014). The interview schedule consisted of five sections. All sections had open ended items designed to probe heads of procurement department's views with regards to available frameworks for supply chain information systems, inventory management, transport management, customer and supplier relationship and warehouse management. For purposes of completeness of information gathered, the researcher conducted face to face interviews with sampled heads of sections within the supply chain.

3.7 Data Collection Procedure

The study relied solely on primary data collected at first hand from the identified textile firms. Questionnaires and interview schedules were therefore developed for purposes of gathering data from primary sources. Prior to data collection, permission was first sought from the university to gather data for the purposes of the study. The researcher then applied and was granted a permit to collect data from the National Council for Science, Technology and Innovation (NACOSTI). Finally, requests for visiting sampled firms to collect data were made to respective firms' management teams.

Data collection was undertaken in consideration of ethical issues in social science inquiry. An introductory letter was prepared for purposes of seeking informed consent from potential respondents to participate in the study. Details revealing the purpose of the study and guarantee of anonymity and confidentiality were included in the letter. Anonymity was assured by concealing respondents' identities and also ensuring that the information collected was not linked directly to the respondent. Confidentiality was assured by the researcher taking responsibility to protect all data gathered within the scope of the study.

3.8 Pilot Study

A pilot study was conducted in order to test the reliability of the employees' questionnaire. A pilot study focuses on establishing the integrity of the tools or

protocols designed specifically for the study. It is interested in finding out whether or not the tools work as expected and how they should be revised in the event that they fail to work (Eldridge *et al.*, 2016). Piloting of the instruments was conducted on 20 employees and 8 heads of section drawn from sections of selected textile firms in Eldoret town involved in the supply chain. Eldoret town was chosen for piloting owing to the fact that being an emerging economy; it offers a diverse range of textile firms suitable for purposes of testing the integrity of the instruments. Moreover, choice of Eldoret for the pilot study was to ensure that respondents used in the pilot do not participate in the actual study so as to eliminate maturation issues of internal validity. Piloting was therefore conducted to for the validity and reliability of the questionnaire and the interview schedule.

3.8.1 Validity

Validity is viewed is as truthfulness and is a measure of how well a conceptualized idea about reality matches the actual reality (Bolarinwa, 2015). Two forms of validity were used to validate the quantitative instrument (employee questionnaire). The first form of validity was face validity which according to Bolarinwa (2015) is the judgment made based on scientific approach on whether the indicator used measures the required construct. Consequently, the researcher sought the opinion and assistance of experts in the field of supply chain management and that of the assigned supervisors on whether as per face value the questionnaire appeared suitable both in design and structure and whether it measured the required constructs. An evaluation of each item was made to find out whether it matched the given conceptual domain of supply chain determinants of performance. This was confirmed albeit with some changes which were implemented.

Content validity was next conducted. Content validity is viewed as the degree with which the instrument measures the required construct (Sangoseni, Hellman & Hill, 2013). Sabgoseni *et al.* (2013) contend that an instrument can only achieve content validity if it undergoes a rational analysis by raters (experts) who have familiarity with the academic scope of study. The researcher therefore asked the supervisors and supply chain experts to critically examine the items measuring specific constructs

with a view to ascertaining whether the full content pertaining to any given construct was represented in the items and whether such content was justified with evidence from literature. On close scrutiny, various suggestions for correction were made and the final document was then produced.

With regards to the qualitative aspects of the study, authenticity of the findings was considered primal. This as noted by Zohrabi (2013) relates to the fairness, balance and honesty exhibited by respondents on topical issues. By use of HoDs interview schedule, the researcher hoped that HoDs would be truthful by avoiding giving distorted accounts of events surrounding supply chain determinants of organizational performance in their respective firms.

3.8.2. Reliability

Reliability is a measure of how dependable or consistent the instrument is in measuring the required construct (Bolarinwa, 2015). Miller (cited in Bolarinwa, 2015) views reliability as the extent to which a measure produces similar results after repeated trials. The employees' questionnaire incorporated closed-ended questions to facilitate proper capturing and analysis of the variables of the study. The reliability of the questionnaires was verified through examination of internal consistency of the measures. This was achieved by computing Cronbach's alpha coefficients using the formula:

$$\alpha = \frac{N \cdot \bar{c}}{\bar{v} + (N - 1) \cdot \bar{c}}$$

Where α is internal consistency; N is number of items; \bar{c} is average covariance between item-pairs; and \bar{v} is average variance

Internal consistency was therefore computed on data collected after piloting the developed questionnaire among a section of 15 employees and 3 heads of department drawn from the departments of selected textile firms in Eldoret town. Interpretation of the coefficients was based on the following threshold cited in Kinoti (2013). $\alpha \geq$

0.9 excellent (High-Stakes testing); $0.7 \leq \alpha < 0.9$ good (Low-Stakes testing); $0.6 \leq \alpha < 0.7$ acceptable; $0.5 \leq \alpha < 0.6$ poor; $\alpha < 0.5$ unacceptable.

In the case of HODs interview schedule which was purely qualitative, reliability focused on establishing the credibility of information given. This was achieved through the multiple accounts made by respondents during piloting. Besides, the researcher examined how transferable the findings were to other similar settings

3.9 Data Processing and Analysis

Data analysis put into consideration the fact that the design used was that of mixed methods and therefore data was both qualitative and quantitative. Consequently, both qualitative and quantitative analysis techniques were used.

3.9.1 Qualitative Data Analysis

The data corpus for the qualitative analysis was the interviews. Collected data was first transcribed and then initial codes were generated in a theory driven manner. The third step involved discovering of recurrent themes among the codes and then a review of the themes was made to assess the evidence associated with respective themes. The themes selected were finally defined and named.

3.9.2 Quantitative Data Analysis

Data from collected from employees within supply chain sections were first coded and entered into the Statistical Package for Social Science (SPSS) Version 22. Next, data were screened and cleaned for missing values and outliers. Data were also tested for normality, linearity, homoscedasticity, autocorrelation, and multicollinearity which are assumptions of regression analysis.

Multiple linear regressions were used to test the formulated hypotheses in order to establish the effect of supply chain determinants on organizational performance and to determine an appropriate model relating organizational performance to supply chain determinants. Hierarchical regression was then used to examine the moderating

effect of background characteristics on the relationship between supply chain determinants and organizational performance. Hierarchical regression was chosen since as noted by Tabachnick and Fidell (2013), it had potential to moderate the influence of employee background characteristics. Prior to regression analysis, the supply chain determinants were correlated with organizational performance to find out whether linearity existed. Consequently, two models were advanced for the study.

1. A model for regression of organizational performance on supply chain determinants showing how each supply chain determinant contributes to individually to organizational performance.

$$OP = \beta_1 SCIS + \beta_2 IM + \beta_3 BSRM + \beta_4 TM + \beta_5 WM + \varepsilon$$

Where;

OP ⇒ Organizational performance

SCIS ⇒ Supply chain information systems

IM ⇒ Inventory management

BSRM ⇒ Buyer-supplier relationship management

TM ⇒ Transport management

WM ⇒ Warehouse management

ε ⇒ Regression residuals

2. The moderation model that regressed organizational performance on supply chain determinants, background characteristics and their interaction variable

$$OP = aSCD + bBC + cZSCD * ZBC + \varepsilon$$

Where;

$OP \Rightarrow$ Organizational performance

$SCD \Rightarrow$ Supply chain determinants

$BC \Rightarrow$ Background characteristics

$ZSCD * ZBC \Rightarrow$ Interaction between standardized supply chain determinants and standardized background characteristics

$a \Rightarrow$ Main effects of supply chain determinants on organizational performance

$b \Rightarrow$ Main effects of background characteristics on organizational performance

$c \Rightarrow$ Moderation effects of background characteristics on the relationship between supply chain determinants and organizational performance.

$\varepsilon \Rightarrow$ Regression residuals

3.9.3 Variable Definition and Measurement

Six variables were used in the present study. The variables were defined and measured as shown in Table 3.3.

Table 3.3: Variable Definition and Measurement

Type of variable	Variable	Indicator
Dependent	Organizational performance	Profitability Responsiveness Flexibility
Independent	Supply chain information systems	MRP systems EDI systems EPOS systems IT infrastructure e- commerce platform
	Inventory management	Inventory accuracy Stock out Stock availability Stock coverage Capacity utilization
	Buyer -supplier relationship management	Communication frequency Amount of information sharing Quality of supplier product Alternatives availability Monitoring of supplier market
	Transport management	Vehicle scheduling Route planning Vehicle maintenance Tracking Disposal
	Warehouse management	Receiving Put-away Storage Pick-n-pack Shipping

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

The purpose of this study was to establish supply chain determinants of performance among textile firms in Nairobi City County. This chapter presents the findings in terms of response rate, reliability results, demographic composition of the study sample, descriptive analysis of independent and dependent variables, inferential analysis of the relationships and discussions thereof.

4.2 Pilot Study Results

Table 4.1 presents results of the reliability of the questionnaire as derived from the pilot study. The coefficients presented in Table 4.1 revealed that the questionnaire was reliable in all the measurement scales used having, achieved the recommended reliability level of 0.7 (Hair *et al.*, 2009). This implies that the scales in question had a high degree of internal consistency among the measurement items.

Table 4.1: Reliability Coefficients

Variables	Employee Questionnaire	
	Number of items	Cronbach's Alpha
1. Supply Chain Information Systems	10	.833
2. Inventory Management	6	.732
3. Customer- Supplier Relationship	10	.857
4. Transport Management	8	.759
5. Warehouse Management	10	.858
6. Firm Performance	8	.739

4.3 Preliminary Results

4.3.1 Response Rate

The need to examine response rate was based on the urge to ascertain whether the proportion of response was representative of the targeted population and could inform decisions on the effect of supply chain determinants on organizational performance. Out of a sample of 290 made up of 265 employees and 25 heads of sections, 156 employees and 19 heads of sections participated in the study. The overall response rate was therefore 60.3% distributed as shown in Table 4.2. On the basis of recommendations by Draugalis, Coons and Plaza (2008) indicating that response rates approximately 60% should be the goal of researchers, this response rate was found to be suitable for purposes of the study.

Table 4.2: Response Rate

Category of respondent	Expected sample size	No responding	Response rate (%)
Employees	265	156	58.9
Head of sections	25	19	76.0
Total	290	175	60.3

4.3.2 Missing Value Analysis

Missing values are reportedly common in social research and have potential to lead to loss of statistical power and may lead to inaccurate inferences (Masconi, Matsha, EchonffoTcheugui, Rajit & Kengue, 2015). Missing values were therefore examined in terms of cases. As shown in Table 4.3, cases 32, 38, 47, and 62 had only 1 missing value each, while case 94 had 2 missing values.

Table 4.3 Missing values

Cases with Missing Values	No. of Values Missing	% Missing
32	1	2.5
38	1	2.5
47	1	2.5
62	1	2.5
94	2	5.0

Since the proportion of missing values was small (less than 5%) in each case, the missing values were replaced by series means as recommended by Tabachnick and Fidell (2013).

4.3.3 Outliers

Outliers are scores that are different from others. According to Tabachnick and Fidell (2007), cases are univariate outliers if they have extreme scores on single variables. However, when they deviate from the centroid of all cases of predictor variables, then they may have multivariate outliers.

4.3.3.1 Univariate Outliers

Univariate Outliers were assessed for each of the independent and dependent variables. All scores of each variable were converted into standard scores. A case was then treated as an outlier if its standard score had an absolute value above 3.0 (Stevens, 2002). An examination of the standard scores did not yield any score with absolute value greater than 3.0. This implies that data were devoid of univariate outliers.

4.3.3.2 Multivariate Outliers

To detect multivariate outliers, Mahalanobis distance (D^2) was used. Tabachnick and Fidell (2013) observe that Mahalanobis distance (D^2) indicates the distance a given case is from the centroid of all cases for predictor variables. In this scenario, a case was deemed a multivariate outlier if the probability associated with its D^2 was 0.001 or less. An examination of the probabilities of the Mahalanobis (D^2) revealed that, none of the probabilities was below 0.001 indicating a lack of multivariate outliers. All the 106 cases were therefore used in the analysis of the employee questionnaire.

4.4 Testing of Assumptions of Multiple Linear Regressions

The supply chain determinants of performance and organizational performance items that were positively worded were first coded and entered into SPSS (version 22). Data for these scales were consequently examined for normality, linearity, homoscedasticity, autocorrelation and multicollinearity requirements for multiple regression analysis which was the principal inferential statistics approach (Tabachnick & Fidell, 2013).

4.4.1 Testing for Assumption of Normality

Normality of variables was tested for the quantitative variables in the employee questionnaire. Lack of a normal distribution in the variables is noted to degrade the solution arrived at (Tabachnick & Fidell, 2013). Normality of the variables was tested for the supply chain variables and the organizational performance variable. Response scores for items measuring these variables were first summed and then averaged to yield the score for a particular variable. Normality of the variables was inspected using the Kolmogorov-Smirnov statistics. This was necessary since the sample size was less than 200. A non-significant value of the Kolmogorov-Smirnov with a p value in excess of 0.05 indicated that data was normally distributed across the respective variable. Results presented in Table 4.4 indicate that all independent and dependent variables had non-significant Kolmogorov-Smirnov statistics. The variables were therefore adjudged to be normally distributed.

Table 4.4: Tests of Normality

	Kolmogorov-Smirnov ^a		
	Statistic	df	Sig.
Supply Chain Information Systems	.085	156	.067
Inventory Management	.067	156	.075
Buyer Supplier Relationship Management	.070	156	.052
Transport Management	.081	156	.091
Warehouse Management	.071	156	.056
Performance	.085	156	.067

a. Lilliefors Significance Correction

The quantile-quantile (Q-Q) plots were then used to confirm normality of each variable. These are normal probability plots for which a normal distribution produces a straight diagonal line which is then compared to the plotted data. Normality of a variable was assumed if the data values were seen to follow the diagonal line.

a) Normality of the Organizational Performance variable

Organizational performance was conceptualized as the dependent variable in the present study. Organizational performance was measured using eight items. The Q-Q plot presented in figure 4.1 shows that plotted points were close to the diagonal line on either side. This shows that the distribution for organizational performance was normal. Hence the variable was used in its original form.

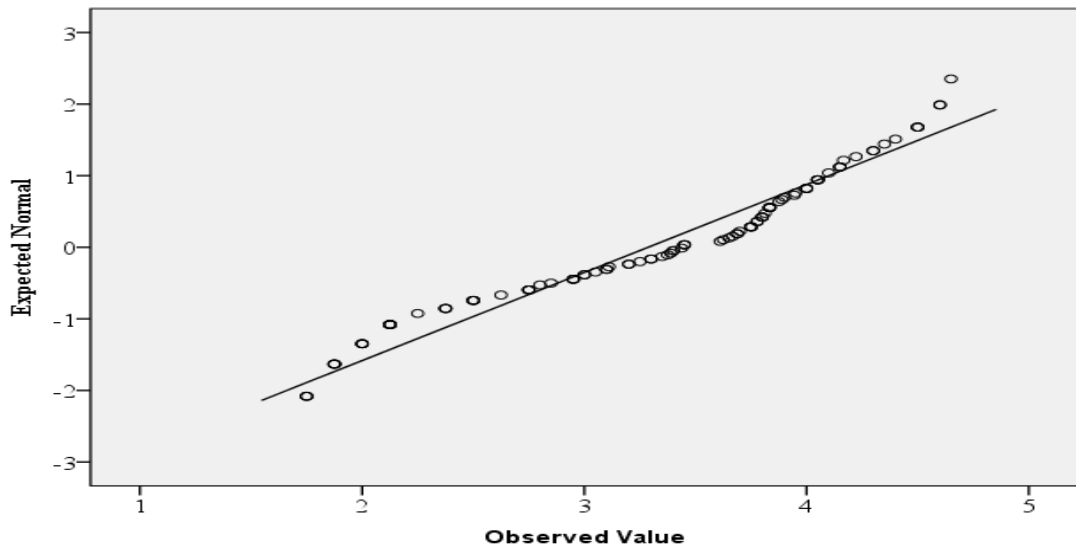


Figure 4.1: Normal Q-Q Plot of Organizational Performance

b) Normality of the Supply Chain Information Systems variable

The Q-Q plot for supply chain information systems presented in figure 4.2 below shows that the data points were relatively along the diagonal line. The point's distribution therefore confirmed that supply chain information systems variable was normally distributed.

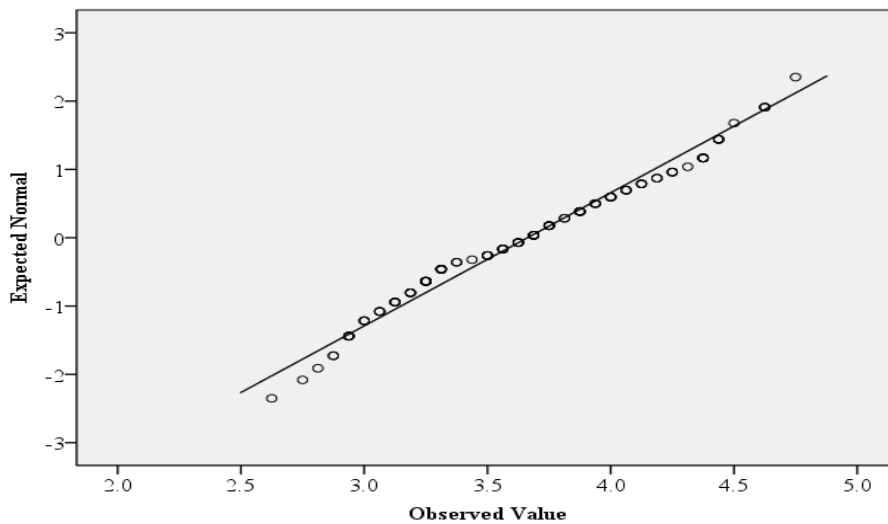


Figure 4.2: Normal Q-Q Plot of Supply Chain Information Systems

c) Normality of the Inventory Management Variable

The Q-Q plot for inventory management presented in figure 4.3 below also confirms that the data were normally distributed. Data points were relatively along the diagonal line.

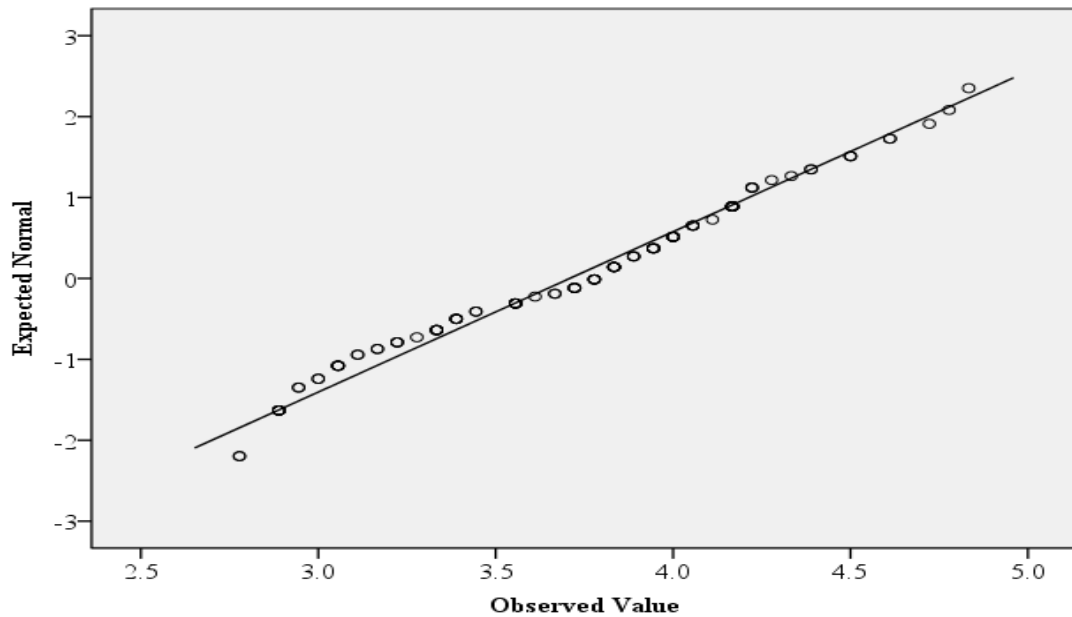


Figure 4.3: Normal Q-Q Plot of Inventory Management

d) Normality of the Buyer Supplier Relationship Management Variable

The Q-Q plot for buyer supplier relationship management variable presented in figure 4.4 shows that the data points were relatively along the diagonal line. The point's distribution therefore confirmed that buyer supplier relationship management variable was normally distributed

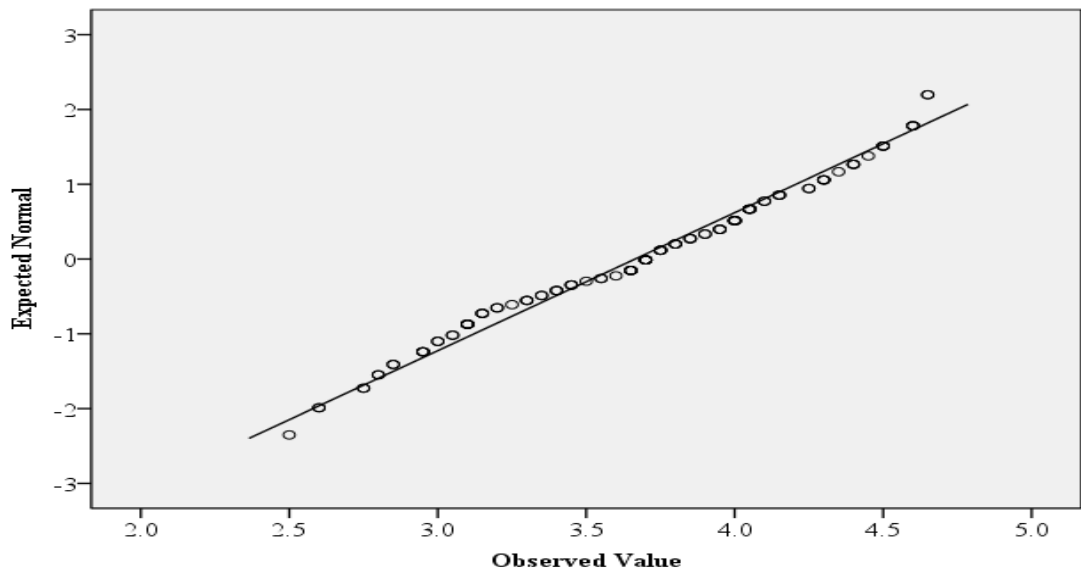


Figure 4.4: Normal Q-Q Plot of Buyer-Supplier Relationship Management

e) Normality of the Transport Management Variable

Data for transport management was also confirmed to be normally distributed (Fig. 4.5). The Q-Q plot for transport management shows that data points were relatively close to the diagonal line.

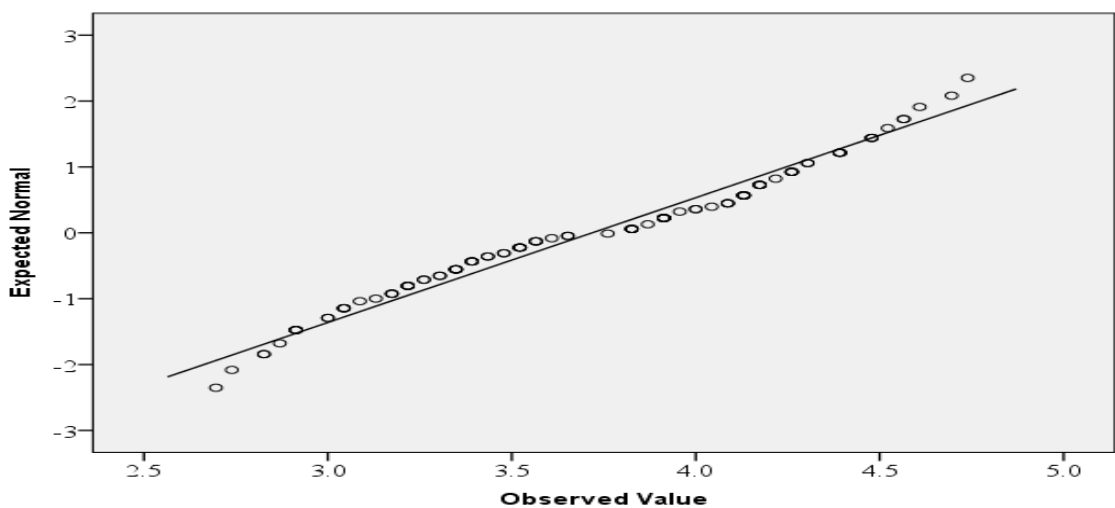


Figure 4.5: Normal Q-Q Plot of Transport Management

f) Normality of the Warehouse Management Variable

Warehouse management was the last variable used to measure determinants of supply chain. The Q-Q plot presented in figure 4.6 shows that plotted points were close to the diagonal line on either side. This confirms that the distribution of warehouse management was also normal.

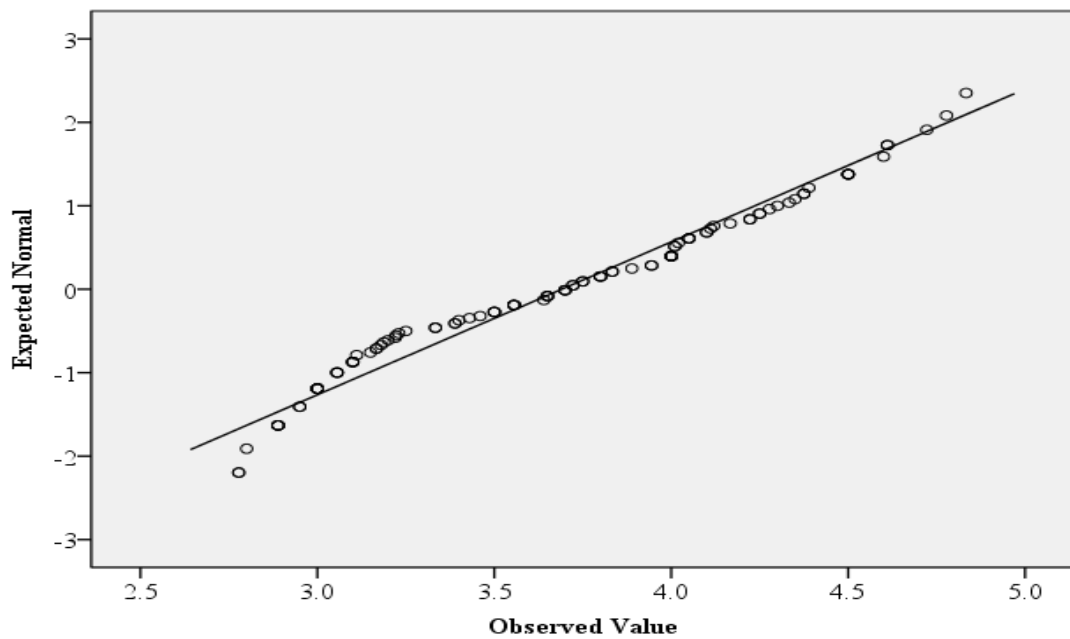


Figure 4.6: Normal Q-Q Plot of Warehouse Management

4.4.2 Testing for the Assumption of Linearity

Linearity is the assumption that a straight line relationship exists between two variables (Tabachnick & Fidell, 2013). Testing for linearity was deemed necessary since linearity is an assumption of regression which must be satisfied. The bivariate Scatter plot was used to assess the degree of linear relationship. This approach was used since Tabachnick and Fidell (2013) note that while Pearson correlation may be used to test linearity, it is limited in determining the degree of linearity given that it only captures the linear component of the relationship. For linearity assumption to be

met, variables were expected to produce oval or elliptical scatter plots. Results shown in Figure 4.7 indicate that oval scatter plots were in all the cells indicating non-violation of the linearity requirement

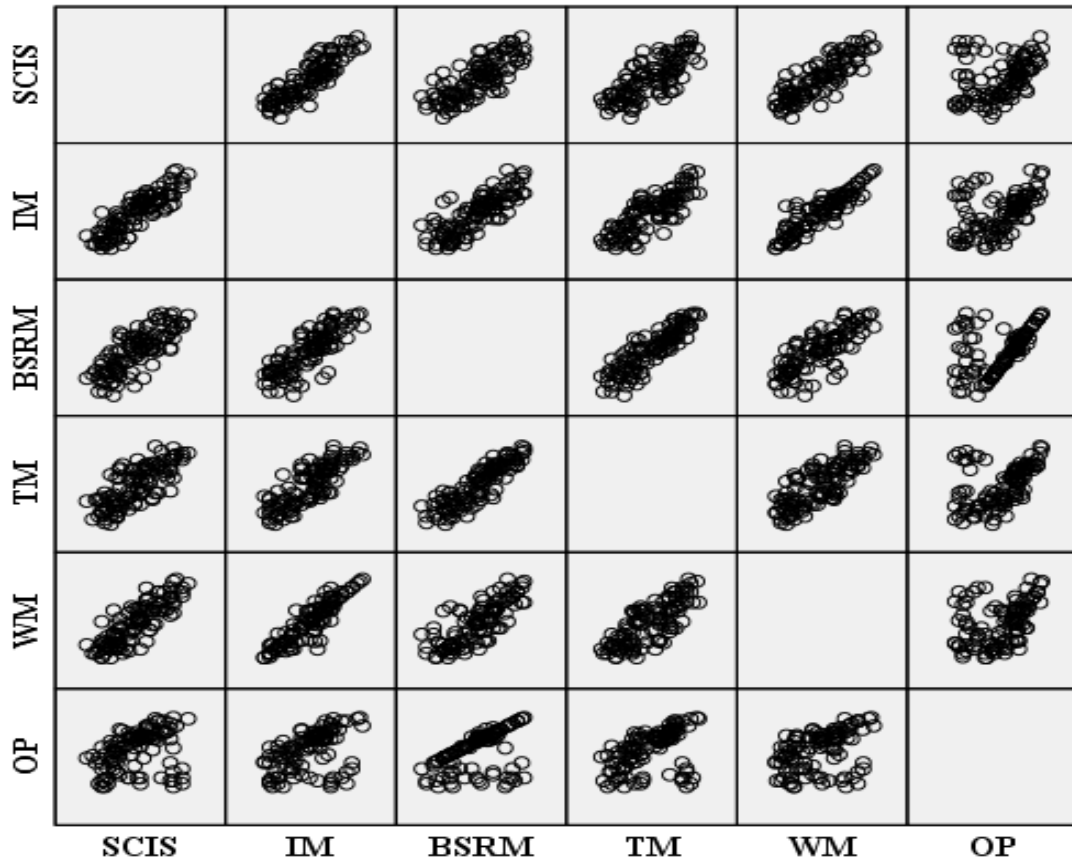


Figure 4.7: Bivariate Scatter Plot

4.4.3 Testing for Homoscedasticity

Homoscedasticity applies to multiple regressions and as noted by Tabachnick and Fidell, (2013), assumes uniform variability in scores for dependent variable in relation to the independent variables. Testing for homoscedasticity was necessitated by the use of hierarchical multiple regression as the principal inferential statistical approach.

Homoscedasticity also referred to as homogeneity of variance or uniformity of variance was tested using levene's test of equality of variances of supply chain

determinants across firm performance. Under this test, the assumption was that the variance of firm performance was equal across groups defined by supply chain determinants of performance. Results shown in Table 4.5 indicate that at 5% level of significance, none of the Levene statistic for supply chain determinants was significant (all probabilities associated with Levene Statistic were above significance level). This indicates that homoscedasticity requirement was not violated.

Table 4.5: Test of Homogeneity of Variances

	Levene Statistic	df1	df2	Sig.
1. Supply Chain Information Systems	3.250	1	156	.074
2. Inventory Management	2.833	1	156	.095
3. Buyer Supplier Relationship Management	.684	1	156	.410
4. Transport Management	.494	1	156	.484
5. Warehouse Management	.250	1	156	.618

4.4.3 Testing for Autocorrelation

Autocorrelation as noted by Tabachnick and Fidell (2013) is a measure of correlation among regression residuals. Occasionally, the assumption of independence of errors is violated when factors such as time and distance are associated with the order in which cases are taken. For instance, respondents interviewed first may vary in response with those interviewed later because of the inexperience the researcher may have with the questionnaire.

Independence of errors was therefore tested using the Durbin-Watson statistic which is regarded as a measure of autocorrelation of errors when the order of cases is factored in (Tabachnick & Fidell, 2013). Under this test, the critical values of $1.5 < d < 2.5$ were used to examine presence of autocorrelation. Consequently, a Durbin-Watson statistic lying within the two critical values was deemed to signify lack of first order linear auto-correlation in our multiple linear regression data. Results

presented in Table 4.6 reveal that the Durbin-Watson statistic $d=1.641$ was between the two critical values and hence there was no first order linear auto-correlation in our multiple linear regression data.

Table 4.6: Model Summary^b

Model	R	R Square	Adjusted Square	R Std. Error of Estimate	Durbin-Watson
1	.909 ^a	.827	.818	.22485	1.641

a. Predictors: (Constant), Warehouse Management, Transport Management, Supply Chain Information systems, Inventory Management, Buyer Supplier Relationship Management

b. Dependent Variable: Performance

4.4.4 Testing for Multicollinearity

Multicollinearity is identified as a situation where independent variables or predictors are highly correlated among themselves (Vatcheva, Lee, McCormick, & Rahbar (2016). In such a situation, the regression model includes many factors that correlated with not only the dependent variable but also among themselves. Vatcheva *et al* (2016) contend that multicollinearity can lead to standard errors being unstable and biased; this may as a consequence result in interpretations that may be unrealistic and untenable. Moreover, in the presence of multicollinearity, it may not be practically possible to assume the interpretation of the regression coefficient as being attributed to one variable while holding others constant because of the information that could be overlapping.

To test for multicollinearity, the Variance Inflation Factor (VIF), this is known to assess the increase in the variance of an estimated regression coefficient when there is correlation among the predictors (Tabachnick & Fidell, 2013). The threshold for rejecting existence of multicollinearity was therefore set at a maximum value of “5”

as suggested by Ringle *et al.*, (2015). Results presented in Table 4.7 show that all the VIF values were below the threshold value of 5 indicating that multicollinearity was not an issue in the present study.

Table 4.7: Collinearity Diagnostics

Variability	Tolerance	VIF
1. Supply Chain Information Systems	.413	2.423
2. Inventory Management	.389	2.573
3. Buyer Supplier Relationship Management	.289	3.466
4. Transport Management	.532	1.880
5. Warehouse Management	.277	3.613

a. Dependent Variable: Performance

4.5 Sample Characteristics of Respondents

Employees' background characteristics were measured in terms of gender, education level, age, and their experience working in the procurement department. The need to examine these characteristics among employees was based on previous studies that have found them to significantly influence employee performance (Agyeman & Ponniah, 2014; Hassan & Ogunkya, 2014). It was therefore necessary to examine them and control for their influence in the present study.

4.5.1 Respondents Gender

Choice of gender as a background characteristic for the present study was informed by findings which show existence of positive correlations between gender diversity and firm performance (Julizaerma & Zulkarnain, 2012). Results of the analysis of respondents gender as presented in Table 4.8, reveal that gender wise, the sample

consisted of slightly more male (53.8%) than female (46.2%) employees. This however represented a good proportion of gender diversity among respondents.

Table 4.8: Gender of Respondent

Category	Frequency	Percent
Female	72	46.2
Male	84	53.8
Total	156	100.0

4.5.2 Respondents Level of Education

Education has been noted to be the catalyst towards a better understanding of organizational structures and control systems that enable employees to be creative, innovative and willing to take initiatives leading to teamwork, quality and improved productivity (Goetsch & Davies, 2006 as cited in Chimwani *et al.*, 2014). It was therefore necessary to assess whether the employees in the procurement departments of the textile firms in Nairobi County meet the relevant levels of education.

From the analysis of respondents' level of education shown in Table 4.9, a majority of the employees were graduates (41.5%), 18.9% were PhD holders while 15.1% had a Masters level of education. It can be concluded that the employees had the relevant education necessary to proactively participate in issues regarding supply chain determinants and firm performance. It should however be noted that formal education may not be a good basis to judge performance potential among employees. Kapila (2008 as cited in Kinoti, 2013) points to inadequacy of certified professionals in supply chain management as a more pressing issue.

Table 4.9: Respondents Level of Education

Level	Frequency	Percent
Secondary Form Four	1	.9
Certificate	22	14.2
Diploma	15	9.4
Graduate	65	41.5
Masters	24	15.1
PHD	29	18.9
Total	156	100.0

4.5.3 Age of Respondents

The study sought to establish the age distribution among employees working in the procurement department of the textile firms in Nairobi City County. This was necessary since as observed by Karanu and Njeru (2014), age moderates the relationship between supply chain determinants of performance and the organizational performance. Results of the descriptive analysis of employees' age distribution presented in Table 4.10 revealed that most employees were aged above 30 years with 58.5% in the age bracket 31-40 years; 22.6% in the 41-50 years bracket and 12.3% above 51 years.

Table 4.10: Age of Respondent

Bracket	Frequency	Percent
Below 30 years	10	6.6
31 - 40 years	91	58.5
41 -50 years	35	22.6
51 – Above	20	12.3
Total	156	100.0

4.5.4 Respondents Experience in Departments

The need to examine respondents experience working in various departmental units was founded on the basis of findings by Braxton (2008) that experience among employees is key to more reliable data on functionalities of any department. Consequently, it was vital to determine the experience among employees of respective departments of textile firms in Nairobi City County which then informed how reliable information gathered from them was.

From the study findings presented in Table 4.11, it is apparent that experience wise, most employees (54.7%) had an experience of 2-5 years, although a good proportion (20.8%) had experience ranging between 11-15 years. The implication is that most employees have been in the respective departments for relatively a long period and could therefore be relied upon to understand supply chain determinants and their potential impacts on organizational performance.

Table 4.11: Respondents' Experience in Department

Duration	Frequency	Percent
Below 1 year	27	17.0
2- 5 years	85	54.7
6-10years	12	7.5
11-15years	32	20.8
Total	156	100.0

4.5.5 Background Characteristics and Study Variables

One way Analysis of Variance (ANOVA) was used to examine how background characteristics impacted on study variables. This was a necessary triangulation approach for justifying use of background characteristics as moderating variables. Results presented in Table 4.12 show that there was no significant differences in Supply Chain Information systems, Inventory Management, Buyer Supplier Relationship Management, Transport Management, Warehouse Management, and organizational performance by gender, level of education, and experience. However, supply chain information systems and buyer-supplier relationships somehow differed significantly in terms of age

Table 4.12: Effect of Background Characteristics on Study Variables

	Gender		Level of Education		Age		Experience	
	F	Sig.	F	Sig.	F	Sig.	F	Sig.
Supply Chain Information Systems	.002	.966	1.015	.413	5.973	.001	.351	.788
Inventory Management	.037	.848	.177	.971	1.979	.122	.532	.662
Buyer Supplier Relationship Management	.245	.622	1.064	.385	3.029	.033	.303	.823
Transport Management	1.928	.168	.800	.552	2.238	.088	.621	.603
Warehouse Management	.435	.511	2.243	.056	.978	.406	.204	.894
Performance	.032	.857	1.603	.166	.978	.406	.913	.438

4.6 Descriptive and Qualitative Data Analyses

Descriptive statistics and recurrent themes were used to give a meaningful description of the quantitative and qualitative variables under study in line with the expectations of the mixed methods design.

4.6.1 Descriptive Results

Descriptive wise, arithmetic means were used to show the typical response among respondents while the standard deviation was used to show the degree of consistency with which the response was made. Responses were elicited on a 5-point likert scale with the following options. 1–strongly disagree; 2–disagree; 3-moderately agree; 4-

agree; 5-strongly agree. The process of developing the scales started with the creation of possible items to measure the six constructs as identified from existing theoretical definitions. The approach of agree-disagree was used due to its simple way of measuring specific opinions (Johns, 2010). Besides, the approach enabled construction of multiple items that constituted likert scales. Analysis of the response scores was conducted on the continuous scale $0.5 < R < 1.5$ -strongly disagree; $1.5 < R < 2.5$ disagree; $2.5 < R < 3.5$ -moderately agree; $3.5 < R < 4.5$ -agree; $4.5 \leq R \leq 5$ – strongly agree.

(a) Supply Chain Information Systems

The first objective of the current study sought to establish the effect of supply chain information systems on organizational performance. Prior to establishing the intended effect, data was first explored to understand the nature of information systems used in supply chains for textile firms in Nairobi City County (Tabachnick & Fidell, 2013). Means and Standard deviations were used to explore responses from employee questionnaire

A total of ten items were used to explore employees from respective departmental unit awareness of the nature of information systems used in supply chains in textile firms within the County. Results of this exploration are presented in Table 4.13. The overall mean response score among employees with regard to the supply chain information systems used in textile manufacturing firms in Nairobi City County was 4.30. This value lies in the interval $(3.5 \leq R < 4.5)$ which implies that employees appeared to show agreement with use of various types of supply chain information systems in the firms. Moreover, the overall standard deviation ($SD=0.673$) was quite small which is an indication of consistency in agreements among the respondents.

In particular, employees tended to agree that the following supply chain information systems are put to use in the firms in question. Material Requirement Planning (MRP) ($M = 4.51, SD = 0.502$) Enterprise Resource Planning (ERP) ($M = 4.38, SD = 0.710$) Procurement and Freight and Resource Auctioning (PFAS) system ($M = 4.38, SD = 0.609$); Warehouse Management System

(WMS) ($M = 4.16, SD = 0.758$); Transport Management System (TMS) ($M = 4.42, SD = 0.567$); and Real time Track and Tracing system ($M = 4.29, SD = 0.617$). Respondents also agreed that invoicing and fund transfer are conducted electronically ($M = 4.44, SD = 0.649$); information systems support decision making ($M = 4.17, SD = 0.798$); interdepartmental communication is effective ($M = 4.19, SD = 0.719$) and that the firms have invested heavily in supply chain information systems ($M = 4.07, SD = 0.796$).

The implications of these results is that employees do agree that textile firms in the county have taken cognisance of the crucial role information systems play towards increasing operational efficiency of supply chains and have as a result invested heavily in a variety of information systems. These systems have resulted in effective communication and improved decision making.

Installation of a variety of information systems is indeed a sure way of assuring seamless supply chains and overall firm performance. Several previous studies have given evidence showing that use of information systems results in improved speed, reduced operational cost, ease of access, time saving and reliability in the supply chain process (Ajayi, 2013; Zhuravleva, 2013; Ergün & Murat, 2012).

Table 4.13: Supply Chain Information Systems

Statements	Mean	SD
1. Material requirement planning (MRP) system is frequently used in this firm	4.51	.502
2. The firm uses the enterprise resource planning (ERP) system to manage its resources	4.38	.710
3. The firm uses the Procurement an Freight and Resource Auctioning (PFAS) system for its procurement functions	4.38	.609
4. The Warehouse Management System (WMS) is used to manage the firms warehouse	4.16	.758
5. Management of the firms transport needs is done using the Transport Management System (TMS)	4.42	.567
6. Tracking of goods and materials is made via the Real time Track and Tracing system	4.29	.617
7. Invoicing and fund transfer are conducted electronically	4.44	.649
8. Information systems have been put in place to support decision making	4.17	.798
9. Interdepartmental communication is effective	4.19	.719
10. The firm has invested on information communication systems	4.07	.796
Overall	4.30	.673

The findings from the quantitative analysis of employee questionnaire responses, point towards a picture showing that textile firms in Nairobi City County have made efforts to integrate information systems in their supply chain processes for purposes of improving performance. This is indeed encouraging and perhaps the way forward if Kenya has to rely on the textile industry for achievement of vision 2030 as envisaged by the Ministry of Industrialization and Enterprise Development (MOIED, 2015).

The findings in this study relating to use of supply chain information systems are consistent with others which have previously been advanced showing the role of ICT in organizational performance (Saldanjan *et al.*, 2013; Projogo & Olhager, 2012). Indeed by prioritizing central coordination, process efficiency and transparency, textile firms in Nairobi City County are positioning themselves to share large volumes of information with partners along the supply chain. This in essence reflects views by Prajogo and Olhager (2012) on the utility of ICT. Moreover, investing in systems focusing on optimum material planning, enterprise resources, warehousing, electronic invoice processing, and efficiency in transportation and tracking as found out in the present study shows the desire for real time processing of data consistent with the views of Kiggira, Mwirigi and Shale (2015).

(b) Inventory Management

The second objective sought to find out the effect of inventory management on the performance of textile firms. Prior to examining the effect, a quantitative analysis of employee questionnaire responses was conducted to identify their awareness of inventory management practices being used in the firms. A total of six items were used to measure employee's views on inventory management in the firms. Responses were elicited on the continuum scale $0.5 < R < 1.5$ -strongly disagree; $1.5 < R < 2.5$ disagree; $2.5 < R < 3.5$ -moderately agree; $3.5 < R < 4.5$ -agree; $4.5 \leq R \leq 5$ – strongly agree.

The overall mean of 4.33 associated with a standard deviation of 0.613 indicates that employees from various departmental units appeared to consistently agree to be aware of inventory management practices on offer in their respective firms (Table 4.14). Among key practices identified for inventory management included: achievement of demand forecasting to determine stock coverage ($M=4.22$, $SD=0.717$); proper material handling to address stock out ($M=4.42$, $SD=0.550$); timely response to customer references ($M=4.43$, $SD=0.535$); ensuring inventory accuracy ($M=4.43$, $SD=0.567$); optimizing capacity utilization ($M=4.30$, $SD=0.650$); and achieving optimal inventory ($M=4.28$, $SD=0.658$).

The implication of these results is that a number of initiatives have been undertaken by respective firms to manage inventory. More importantly, employees seem to be aware of these initiatives. In essence, textile firms operating in Nairobi City County recognize the importance of inventory management in the success of supply chain processes. Consequently, management have taken regard of the need to fulfill orders accurately, plan and order inventory better, and more importantly, increase consumer satisfaction.

Table 4.14: Inventory Management

Statements	Mean	SD
1. The firm achieves accurate demand forecasting to determine stock coverage	4.22	.717
2. The firm has put in place proper material handling in cases of stock out	4.42	.550
3. The firm makes timely response to customer references to ensure stock availability	4.43	.535
4. The firm has mechanisms in place to ensure inventory accuracy	4.34	.567
5. The firm optimizes utilization of its capacity	4.30	.650
6. The firm achieves optimal inventory	4.28	.658
Overall	4.33	.613

The findings regarding practices employed for inventory management among the sampled textile firms is a clear manifestation of the importance they attach to inventory management as a supply chain determinant of organizational performance. The current state of the art practices for inventory management shows a desire not to leave nothing to chance and is consistent with views by Silvestro and Lustrato (2014) indicating that investment on material flow management has potential to ensure timeliness and efficiency in delivery of products to end users.

Use of diverse practices to manage inventory as found out in the present study points to textile firms as being keen to focus on synchronizing the flow of materials across their supply chain. This supports findings which show that firms use a number of practices to coordinate the flow of materials for purposes of attaining higher performance (Onchoke & Wanyoike, 2016; Mwangi & Nyambura, 2015).

The findings showing that textile firms in Nairobi City County make timely response to customer references and that they have in place mechanisms for inventory accuracy vindicate the urge among these firms to remain competitive by controlling inventory. Other studies have also shown the utility of inventory management in improving operations efficiency (Mogere, Oloko & Okibo, 2013); improving returns on sales and returns on equity (Lwiki *et al.*, 2013); increasing firm performance through holding stocks and ordering costs (Kitheka & Ondiek, 2014), and increasing competitiveness (Wangari, 2015)

(c) Buyer Supplier Relationship Management

The third objective focused on examining the effect of Buyer Supplier Relationship Management in the supply chain process on firm performance. Buyer Supplier Relationship Management as exists in textile firms was examined using both descriptive and thematic analyses of employees and heads of sections responses respectively.

Ten items on the employee questionnaire were used to explore the prevailing management of Buyers and suppliers relationships. Responses were elicited on a 5-point likert scale which was transformed into the continuum scale 0.5 < R < 1.5 – strongly disagree; 1.5 < R < 2.5 disagree; 2.5 < R < 3.5 – moderately agree; 3.5 < R < 4.5 – agree; 4.5 ≤ R ≤ 5 – strongly agree.

Results presented in table 4.15 shows an overall agreement among respondents on the need to manage buyer -supplier relationship in the textile supply chain ($M=4.35$, $SD=0.583$). Employees tended to agree that there is frequent communication between the respective firms and customers on the one hand and suppliers on the

other ($M= 4.40$, $SD=0.558$); information sharing improves respective firms supply chain processes ($M=4.46$, $SD=0.546$), Trust leads to high levels of satisfaction in the firm ($M=2.10$, $SD=0.865$); partnership initiatives reduces risks of competing product introduction ($M=4.41$, $SD=0.564$); customers and suppliers are provided with information about the manufacturing process ($M=4.41$, $SD=0.548$); and that the firms share risks mutually with customers and suppliers ($M=4.32$, $SD=0.578$) among others.

The implication of these results is that in the recognition of the importance of close relations between supply chain partners, textile firms are maintaining a close and mutual relationship with both their customers and suppliers. Both suppliers and customers are given due respect and relevant information is availed to them. This in return leads to high levels customer and supplier satisfaction and results in improvement in performance.

Table 4.15: Buyer Supplier Relationship Management

Statements	Mean	SD
1. The firm frequently communicates with its customers and suppliers	4.40	.588
2. Information sharing improves the firm's processes	4.46	.546
3. Trust leads to high levels of satisfaction in the firm	4.45	.537
4. Partnership initiatives reduces risks in competing product introduction	4.41	.564
5. Reduces the product design cycle time	4.42	.534
6. The firm provides customers with information about manufacturing process	4.41	.548
7. The firm shares risks mutually with its customers and suppliers	4.32	.578
8. Frequent information sharing	4.33	.596
9. There is a strong relationship between the firm and its customers	4.22	.676
10. The firm appraises its suppliers regularly	4.11	.682
Overall	4.35	.583

The finding that trust leads to high levels of satisfaction within the supply chain are consistent with findings by Dyer and Chu (as cited in Vieira, Paiva, Finger & Teixeira, 2013) showing that trust among partners reduces the need to monitor supplies in terms of timeliness and quality. Moreover, the findings relating trust and information sharing supports views by Ideet and Wanyoike (2014) that trust, partnership initiatives, and information sharing were key buyer–supplier relationship indicators that influence performance of Geothermal companies of Kenya Power.

Other studies also find management of buyer supplier relationship central to supply chain processes and, associate it with supply chain collaboration (Gumboh & Gichira, 2015), customer-supplier relationship (Makau & Muturi, 2015), organizational performance (Wachiuri, Waiganjo & Oballah, 2015), joint management of inventories and also motivates collaboration (Watiri and Kihara, 2017), and sustainable competitive advantage (Nyamasege & Biraori, 2015).

(d) Transport Management

The fourth objective of the current study sought to establish the effect of transport management within the supply chain on firm performance. Prior to establishing the intended effect, data was first explored to understand the nature of transport management mechanisms used in textile firms in Nairobi City County (Tabachnick & Fidell, 2013). Means and Standard deviations were used to explore responses from employee questionnaire. A total of eight items were used to explore mechanisms used for the management of transport from departmental employees' perspective. Results of this exploration are presented in Table 4.16. The overall mean response score among employees with regard to the transport management mechanisms used in textile firms in Nairobi City County was 4.28. This value lies in the interval $3.5 \leq R < 4.5$ which implies that employees appeared to show agreement with use of various mechanisms in the firms to manage transportation. Moreover, the overall standard deviation ($SD=0.641$) was rather small which is an indication of consistency in agreements among the respondents.

More particularly, employees tended to agree that the following transport management mechanisms were being used in the firms. Firms have established sufficient transportation units ($M = 4.40, SD = 0.611$) improved vehicle scheduling ($M = 4.23, SD = 0.670$) thorough route planning ($M = 4.25, SD = 0.619$); defined disposal policy ($M = 4.12, SD = 0.645$) fleet management system ($M = 4.26, SD = 0.633$) installation of tracking system ($M = 4.30, SD = 0.634$). Respondents also agreed that textile firms undertake preventive maintenance ($M = 4.34, SD = 0.659$); and have also put in place vehicle inspection schedules ($M = 4.34, SD = 0.659$).

These results imply that textile firms operating in the Nairobi City County recognize the important effective transport management play towards increasing operational efficiency of supply chains. In response to this, most of those firms have put several mechanisms in place to ensure that there is appropriate transport management within the supply chain processes.

These results showing the seriousness textile firms in Nairobi County are putting on transport management resonates well with other studies that have intonated that endeavors of managing transport allows end-to-end network visibility that enables centralization of production operations to areas that experience lower costs, without compromising levels of customer service. A responsive transportation network begins with end-to-end network visibility (Mukolwe & Wanyoike, 2015).

Moreover, the results from the employees' questionnaire confirm previous positions that have been advanced with regards to the utility of transport management in supply chain processes. Such positions include: influencing performance of logistic firms (Kithiia, 2015); impacting negatively on efficiency of freight logistics (Muchori, 2015); leading to operational efficiency (Mukolwe & Wanyoike, 2015); and predicting performance (Mwangangi, 2016).

Table 4.16: Transport Management

Statements	Mean	SD
1. There are sufficient transportation units in the firm	4.40	.611
2. Current vehicle scheduling practices have improved transportation of materials and produce	4.23	.670
3. The firm conducts thorough route planning	4.25	.619
4. The firm has in place a clearly defined disposal policy	4.12	.645
5. The firm has a system in place for managing its fleet	4.26	.633
6. The firm has installed a tracking system	4.30	.634
7. The firm undertakes preventive maintenance	4.34	.659
8. The firm has a vehicle inspection schedule	4.34	.659
Overall	4.28	.641

(e) Warehouse Management

The fifth objective sought to find out the effect of warehouse management on the performance of textile firms. Prior to examining this effect, a quantitative analysis of employee questionnaire responses was conducted to examine how warehousing was being conducted in textile firms in Nairobi City County. A total of ten items were used to measure the employee's views on existing warehouse management practices. Responses were elicited on the continuum scale 0.5<R<1.5-strongly disagree; 1.5<R<2.5 disagree; 2.5<R<3.5-moderately agree; 3.5 < R< 4.5-agree; 4.5≤R≤5 – strongly agree.

The overall mean of 4.28 associated with a standard deviation of 0.641 indicates that most department employees appeared to consistently agree that textile firms in Nairobi City County have several warehouse management practices in place (Table 4.17). Among key practices identified for warehouse management included: availability of enough warehouses ($M=4.02$, $SD=0.738$); automating warehousing

activities ($M=4.27$, $SD=0.636$); improving efficiency of warehousing activities ($M=4.37$, $SD=0.584$); timely delivery of orders as per customer requested date ($M=4.19$, $SD=0.692$); perfect picking, packing and shipping of lines ($M=3.97$, $SD=0.758$); and optimizing total warehousing cost ($M=4.31$, $SD=0.629$) among others.

The implication of these results is that a number of practices have been put in place by respective textile firms to manage warehouses. More importantly, employees seem to be aware of these initiatives. In essence, textile firms operating in Nairobi County recognize the importance of satisfying customers through efficiency in services. Consequently, most of the firms treat customer orders with due diligence. In such cases, orders are delivered without changes, damage or invoice errors and on time per customer requested date.

These results show that textile firms in Nairobi County are aware of existence of factors that may interfere with supply chain processes. These factors include production and consumption habits that are seasonal; variability in demand; manufacturing economics, initiatives undertaken for marketing and promotion; variation in products and customer needs; and ever evolving service requirements. Such factors therefore do require efficient warehousing facilities for efficiency in the supply chain process.

The results drawn from the questionnaire responses lend support to a plethora of existing local studies highlighting the central role of warehousing. The studies show among other findings that automation of warehouse management activities for instance, has potential to enhance required accuracy, operational speed and limit wastage (Mukolwe & Wanyoike, 2015); significantly and positively affects financial performance (Wambua *et al.*, 2015); impacts warehouse management positively (Karimi & Namusonge, 2014).

Table 4.17: Warehouse Management

Statements	Mean	SD
1. There are enough warehouses	4.02	.738
2. Shutting down of the firm does not affect material supply	4.11	.696
3. Most warehousing activities are automated	4.27	.636
4. Warehousing activities have improved efficiency	4.37	.584
5. Orders are delivered on time per customer requested date	4.19	.692
6. Orders are usually filled completely on first shipment	4.05	.676
7. Lines are picked, packed and shipped perfectly	3.97	.758
8. Orders are delivered without changes, damage or invoice errors.	4.00	.745
9. Order are picked, packed and shipped perfectly	4.18	.548
10. The firm optimizes total warehousing cost	4.31	.629
Overall	4.15	.670

(f) Organization Performance

Organization performance was conceptualized as the dependent variable in the study. Eight questionnaire items reflecting reliability, responsiveness, flexibility, cost, and efficiency were therefore used to measure the textile firm's prevailing levels of performance. Responses were also elicited on a 5-point likert scale with the following options. 1–strongly disagree; 2–disagree; 3–moderately agree; 4–agree; 5–strongly agree. Analysis of the response scores was conducted on the continuous scale $0.5 < R < 1.5$ –strongly disagree; $1.5 < R < 2.5$ disagree; $2.5 < R < 3.5$ –moderately agree; $3.5 < R < 4.5$ –agree; $4.5 \leq R \leq 5$ – strongly agree

As shown in Table 4.18, the overall mean score was 4.35 which indicate that respondents mainly agreed with the items. The standard deviation value of 0.617 confirms that there were little variations in response scores. Specific results pointed to improvement in the firm's corporate image ($M=4.50$, $SD=0.525$); achievement of

production efficiency within the firms ($M=4.58$, $SD=0.522$); improvement of product quality ($M=4.60$, $SD=0.514$); increased profitability ($M=4.42$, $SD=0.557$); achievement of higher returns on investment ($M=3.77$, $SD=.914$); reduction in material costs ($M=4.30$, $SD=0.678$); creation of new market opportunities ($M=4.37$, $SD=0.585$) and have become more reliable in operations ($M=4.26$, $SD=0.637$) as some notable performance areas in the textile firms visited.

The results highlighted suggest that several measurement of performance are being addressed in textile firms in Nairobi City County possibly because of elaborate efforts to address key supply chain determinants. Indeed, several studies show that organizational performance depends on addressing key organizational factors that may influence performance (Kitonga *et al.*, 2016; Awino, 2015; Kariuki & Murimi, 2015; Odhon’g & Omolo, 2015).

Table 4.18: Organization Performance

Statements	Mean	Std. Deviation
1. The firm has improved its corporate image	4.50	.525
2. The firm has achieved production efficiency	4.58	.522
3. Product quality has been improved	4.60	.514
4. There has been increase in profitability	4.42	.557
5. The firm has achieved higher returns on investment	3.77	.914
6. Material costs have reduced	4.30	.678
7. New market opportunities have been created	4.37	.585
8. Employee motivation has been enhanced	4.26	.637

4.6.2 Qualitative Data Analysis

Thematically, recurrent themes were drawn from qualitative responses on interviews conducted with heads of departments. As many potential themes as possible were manually coded for purposes of establishing patterns.

(g) Supply Chain Information systems.

Exploration of the views of heads of sections on supply chain information systems was conducted using two items on their interview schedule. First, they were asked the main priority goals that they base on when deciding to use supply chain information systems in supply chain functions. Second, they were asked to identify challenges experienced in using information systems in supply chain functions

Three themes commonly emerged from the participating heads of departments with regards to priority goals based on when deciding to use information systems during operations. Central coordination was identified by all the participants of the interview as the one of the priority goals that drives use of information systems. The finding was consistent with the views of Lemma, Singh and Kaur (2015) that as organizations focus on core functions, coordination of the diverse functions becomes necessary. Lemma *et al.* argue that coordination of both external and internal activities within their supply chains has the potential to boost fruitful outcomes.

Process efficiency emerged as the other goal that helps inform choice of the supply chain information systems. Heads of departments argued that enhanced communication with partners will improve services and therefore supply chain information systems have potential to streamline operations leading to achievement of the firms' goals. The third significant goal that was identified with regards to choice of information systems was Expenditure transparency. Heads of sections noted that information systems cannot be manipulated easily and therefore promote fairness, integrity and minimize corruption.

When further asked to identify challenges experienced in using supply chain information systems in supply chain functions, lack of knowledge, funding and the pace of change were cited. It was noted that firms were not well equipped internally to support and nurture effective exploitation of benefits of information systems in supply chain functions. Furthermore, most of the firms lacked the necessary infrastructure and expertise needed. The funding challenge was reported to be

occasioned by pressure to minimize production costs for purposes of remaining competitive.

(h) Inventory Management.

Examination of heads of sections views on prevailing inventory management mechanisms were examined using three questions. The first question sought to identify strategies firms use to optimize inventory and material flow. Next, they were asked to identify practices which have been put in place to manage inventory. Last, but not least, they were asked whether the firm had implemented current inventory management systems.

Three strategies emerged as often used to optimize inventory and material flow. Holistic analysis was cited by the entire set of participants as a strategy adopted for its potential to optimize supply chain network and inventory. Under this strategy, a team comprising of firm owners, key operational personnel, and engineers both internal and outsourced is formed to assess the flow of materials and products, and then put their insights together.

Forecasting was the other strategy cited by the entire set of heads of departments for its potential to cut costs and for seamless flow of materials by predicting various future needs. Participants noted that future demands were often within their contingency plans, and therefore present and past trends were used to forecast future demands. Moreover, the HODs observed that various departments use existing receipts history and purchase orders in their aspiration to forecast lead time, as well as the future average issue size. The third strategy identified was inventory segmentation. Two participants noted that the departments have segmented inventory basing on the frequency of movement and use, and that there are policies that have been put in place address the inventory segments with regards to control of items as well as review of potentially obsolete ones.

On the question of practices used to manage material flow, periodic review uniqueness, and patterning were identified. It emerged that materials were reviewed periodically for replenishment of stock. Besides, focus was on unique brands not easily imitable. When further asked whether current material flow systems had been implemented, the verdict was yes. Among some of the key systems identified were: Enterprise Resource Planning (ERP), Vendor managed inventory (VMI), economic order quantity (EOQ), just in time approach (JIT), radio frequency identification (RFID), and oracle application implementation.

(i) Buyer-Supplier Relationship Management.

An examination of existing customer–supplier relationship was conducted using interviews with the heads of departments. Two items were used to explore respondent’s views with regards to relationships with suppliers. First and foremost, respondents were asked to identify supplier attributes that strengthens the firm’s relationship with them. Second, they were asked to factors that lead to strained relationships between them and their suppliers.

Three themes emerged from the various narratives of the participants regarding customer-supplier relationship management within the firms. Supplier capability was demonstrated through the HODs narratives as a key supplier attribute that textile firms in Nairobi City County look for in their suppliers. Suppliers were expected to have adequate technical knowledge of materials that are relevant for production. Besides, they needed to show sufficient proof of their capacity to meet targets.

The second attribute that emerged is commitment. Under this attribute, participants’ narratives demonstrated keenness on values and integrity. It was suggested that the supplier ought to be willing to share mutual goals with the firm, and must demonstrate sincerity, honesty and integrity. Besides, most of the heads intoned that they expect courtesy and respect from a supplier and he or she should be cooperative and flexible. Another common theme among the various participants’ narratives was their persistent reference to consistency among suppliers. Through

their narratives, they demonstrated that they would rather receive supplies that do not vary as much.

On the question of challenges that strains firm-supplier relationship management, both firm oriented and supplier oriented challenges were identified. Among the key firm oriented challenges noted are; lack of transparent processes when sourcing for suppliers, delayed supplier payments, and contractual conflicts. Key among the challenges that are supplier oriented includes: delivering damaged goods, complex culture, and poor communication skills.

(j) Transport Management.

Examination of heads of sections views on prevailing transport management mechanisms were examined using three questions. The first question sought to identify strategies firms use to manage transport in their supply chains. Next, they were asked to identify benefits accruing from adoption of transport management systems. Last, but not least, they were asked challenges they face in transport management.

Several strategies could be discerned from participant's narratives. However three themes were more recurrent in relation with transport management. Centralized transportation data was cited by the entire set of participants as a strategy adopted due to its potential to enable ease of access to vital transportation information. The second strategy that was discerned is integration of transportation process. Under this strategy, narratives demonstrated keenness on efficient operation of the transport section. Holistic approach to transportation data was the third strategy identified.

On the question of benefits accruing from the adoption of transportation management systems, two themes were consistent among participants. Most narratives pointed to increased customer services as a potential benefit that the firm enjoys as a result of using transport management systems. They noted that firms were able to analyze the freight spend by customers, orders or products, allowing the respective firms to come up with product pricing structures that are competitive.

Identification of new delivery capabilities was also noted as a key benefit. According to the heads, firms have put in place distribution programs that have made them reach multiple locations even those hitherto un-explored thereby, increasing overall efficiency. In addition, It was noted that management transportation has led to the firms establishing new partnerships that have enabled them to be visible in real-time and be more efficient.

(k) Warehouse Management.

Exploration of heads of department's views on ware house management was conducted using two items on their interview schedule. First, they were asked the main warehouse management practices they use and second, the challenges faced in warehouse management. A number of practices for warehouse management were identified and include; product scanning, freight consolidation, real-time data management, and strategic consultation. On the question of challenges faced, four challenges were discerned from the narratives. The first challenge identified was automation of the inventory. One participant noted that sometimes there was a problem telling what was in the inventory for lack of appropriate technology. This occasionally led to unexpected shortages which did not auger well with customers.

Inventory location was also identified as a challenge facing the firms in relation to warehouse management. It was reported that the process of loading products for transportation was often delayed when those who are sent to pick them have to search for the items. The other two challenges that featured prominently in the narratives were warehouse layout and picking optimization

4.6 Inferential Results

Inferential analyses were conducted to specifically ascertain the effect of the conceptualized supply chain determinants of performance on organizational performance by testing the formulated hypotheses. The principal inferential statistic was the hierarchical regression that was intended to establish the impacts of each determinant while holding the influences of the background variables under control.

However, given that regression occurs when there is correlation, correlations were first conducted between each determinant and firm performance to ascertain whether indeed a relationship existed before checking for the effect of the particular determinant.

4.6.1 Correlation Results

Pearson's product moment correlations were used to examine whether there exists a relationship between supply chain determinants and organizational performance. This was necessary since as noted by Tabachnick and Fidell (2013), regression can only be conducted after correlations have been confirmed.

Results of the correlations are presented in Table 4.19, and show significant positive correlations among the supply chain determinants and also between individual supply chain determinants and organizational performance. Specifically, there was a moderate positive correlation between supply chain information systems (SCIS) and inventory management (IM) ($r = 0.657, p < 0.05$); Transport management (TM) ($r = 0.544, p < 0.05$); warehouse management (WM) ($r = 0.666, p < 0.05$). However, there was a high positive correlation between supply chain information systems and buyer-supplier relationship management (BSRM) ($r = 0.719, p < 0.05$); and between supply chain information systems and organizational performance (OP) ($r = 0.755, p < 0.05$).

The implication of these results is that supply chain information system has a linear relationship with other supply chain determinants and more importantly with organizational performance. This means that for other supply chain determinants to work effectively, they must invest in information systems. Linearity between supply chain information systems with organizational performance paves way for considering it as a predictor of organizational performance.

Results also show that inventory management correlates highly and in a positive manner with buyer-supplier relationship management ($r = 0.740, p < 0.05$); warehouse management ($r = 0.704, p < 0.05$); and organizational

performance($r = 0.774, p < 0.05$). However, it correlates rather weakly in a positive way with transport management($r = 0.443, p < 0.05$). This is rather interesting and calls for further research. Although strong positive correlations existed between buyer-supplier relationship management with warehouse management ($r = 0.776, p < 0.05$) and organizational performance($r = 0.862, p < 0.05$), it correlated moderately in a positive way with transport management ($r = 0.515, p < 0.05$) which calls for further research as well.

Interestingly, transport management, a key facet of logistics appeared to correlate weakly in a positive way with organizational performance($r = 0.463, p < 0.05$), which provides impetus for further scrutiny. As expected however, transport management correlated moderately with warehouse management ($r = 0.663, p < 0.05$). satisfactorily though, warehouse management had a strong positive correlation with organizational performance($r = 0.788, p < 0.05$). The bottom line however, remained that regressing organizational performance on supply chain determinants remains viable.

Table 4.19: Correlation Results

	SCIS	IM	BSRM	TM	WM	OP
SCIS	1					
IM	.657**	1				
BSRM	.719**	.740**	1			
TM	.544**	.443**	.515**	1		
WM	.666**	.704**	.776**	.663**	1	
OP	.755**	.774**	.862**	.463**	.788**	1

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

4.7 Results of the Tests of Hypotheses

Descriptive analysis of the employees' and sectional heads responses revealed that supply chain determinants of performance appeared to directly impact on firm performance as conceptualized in the present study. It was therefore necessary to confirm existence of causal relationships between the individual determinants and firm performance by testing the hypotheses formulated in this study.

Multiple linear regression analysis was used to test the hypotheses. Under this approach, organizational performance was regressed on the five identified supply chain determinants. The idea was to examine the influence of each of the determinants on organizational performance.

4.7.1 Model Summary Results

The model summary statistics displayed in Table 4.20 show that the coefficient of determination (R Square) for combined set of supply chain determinants was 0.827 which indicates that variations in supply chain determinants accounted for up to 82.7% of variations in organizational performance.

Table 4.20: Model Summary^b

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.909 ^a	.827	.818	.22485	1.641

a. Predictors: (Constant), Warehouse management, Transport management, Supply chain information systems, Inventory management, Buyer-supplier relationship management

b. Dependent Variable: Organizational performance

4.7.2 The ANOVA

The ANOVA output revealed that the hypothesized linear regression model was statistically adequate. The significant F-value in model 2 revealed that the regression coefficients were significantly different from zero ($F_{5,100} = 95.686, p < 0.05$).

Table 4.21: ANOVAa

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	24.188	5	4.838	95.686	.000 ^b
	Residual	5.056	150	.051		
	Total	29.243	155			

a. Dependent Variable: Organizational performance

b. Predictors: (Constant), Warehouse management, Transport management, Supply chain information systems, Inventory management, Buyer-supplier relationship management

4.7.3 Regression Coefficients

An examination of the regression coefficients displayed in Table 4.22 indicates that the regression coefficients of the conceptualized determinants were significant. The implication was that all of the supply chain determinants used had impacts on organizational performance.

Table 4.22: Regression Coefficients

		Coefficients ^a				
		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	.374	.202		1.848	.068
	SCIS	.196	.057	.223	3.442	.001
	IM	.153	.057	.180	2.697	.008
	BSRM	.379	.068	.429	5.537	.000
	TM	.101	.041	.140	2.449	.016
	WM	.292	.085	.273	3.454	.001

a. Dependent Variable: OP

4.8 Results of Hypotheses Testing

4.8.1 The Effect of Supply Chain Information Systems on Performance

Hypothesis **H₀₁** stated that supply chain information systems had no significant effect on performance. To test this claim, hierarchical multiple regressions model was used with gender, education, age and experience of employees being entered in the first model, while the information systems together with the other four determinants were entered in the second. The regression coefficients displayed in Table 4.22 indicates that supply chain information systems were positive and significant determinants of performance ($\beta = 0.223$, $P < 0.05$). This implies that an increase of a unit standard deviation in supply chain information systems is likely to increase performance by 0.223 standard deviations, when the other determinants are held constant.

The hypothesis that supply chain information systems have no significant effect on procurement performance was therefore rejected. The implication is that application of information systems in supply chain has direct effects on performance in textile firms. Consistent with findings from departmental employee's questionnaire responses, it is clear that textile firms in Nairobi City County exploit the direct impact information systems have on overall performance to ensure that there is an enabling framework through which such systems can thrive. The researcher however noted that use of information systems within the firms faces challenges in terms of expertise, funding and changes in technology.

The findings in this study that information communication technology directly affects performance is consistent with findings previously established showing that use of information systems not only improves ability to be competitive, but also improves customer supplier relationship and by extension information quality (Kariuki & Shale (2015). the present study deviates from that of Kariuki and Shale in the sense that whereas these two focused on super markets, this one brings in the textile sector. Moreover, findings showing that a variety of supply chain information systems are used point, to an endeavour among the firms for operational efficiency

which together with operational flexibility are reported to relate highly with organizational performance (Kinyua-Njuguna *et al.*, 2014).

The finding that supply chain information systems have positive and significant effects on performance in textile firms in Kenya adds a new frontier to existing findings which hardly mention textile industries. Momanyi and Sanewu (2014) for instance report that use of information communication technology has impacted positively on performance in Ferry services. A noticeable aspect in the study by Momanyi and Sanewu is over reliance on the questionnaire and use of a sample 30.6% sample size. The present study addresses these pitfalls by not only triangulating data collection by bringing in interview schedules, but has also increased the sample size to 85.4%.

Findings in the present study regarding utility of information systems is also consistent with findings by Weeks and Namusonge (2016) showing that supply chain information systems positively and significantly contributes to organizational performance through its ability to drive procurement; and also by Kimechwa (2015) that ICT affects the performance of post bank through data transaction and display modes. The present study improves on findings by Kimechwa by using regression which is well suited for influence analysis (Tabachnick & Fidell, 2013) as opposed to chi-square which measures association and t-test which is ideal for comparative studies.

4.8.2 Effect of Inventory Management on Performance

Hypothesis **H₀₂** postulated that inventory management had no significant effect on performance. The hierarchical multiple regressions results presented in Table 4.22 revealed that inventory management positively and significantly affects performance in textile firms in Nairobi City County ($\beta = 0.180$, $P < 0.05$). The implication is that a unit standard deviation increase in inventory management has potential to improve firm performance by 0.180 standard deviations. The hypothesis that inventory management had no significant effect on performance was therefore not supported.

The regression finding that shows that inventory management impacts positively on performance explains the descriptive and thematic findings which showed awareness among procurement employees and heads on the need to manage inventory. Moreover, it justifies the need to have in place various strategies and practices for inventory management and why it is necessary to consider modern inventory management systems.

The findings that most of the textile firms in Nairobi City County make use of inventory systems such as Enterprise Resource Planning (ERP); Vendor managed inventory (VMI); economic order quantity (EOQ); just in time approach (JIT); radio frequency identification (RFID), and oracle application implementation reflects findings by others (Ngei & Kihara, 2017; Mogere *et al.*, 2013) showing that use of such systems has a positive influence on efficiency and significantly predicts firm performance. The researcher having noted that Mogere and others piloted their instruments on the same study subjects while Ngei and Kihara relied on questionnaires only improved this by piloting the tools on different subjects with similar characteristics and then triangulating data collection.

The regression findings showing existence of a positive effect of inventory management on performance are consistent with findings by Lwiki *et al.* (2013) that show inventory management to impact organizational performance in terms of return on sales and return on equity. The findings also support findings that show that inventory auditing, inventory security practices, and computerized inventory control positively and significantly influences procurement performance (Onchoke & Wanyoike, 2016). The present study addressed the weaknesses exposed by the drop and picks approach used by Onchoke and Wanyoike by adopting the approaches where the researcher administered the instruments and ensured that the required study units were the ones that responded.

These findings reflect others in existing literature that point to the direct influence of material flow or inventory control on performance (Chimwani *et al.*, 2014; Dettoratus, Raman & Craig, 2013; Tinggi & Kadri, 2012). According to Chimwani *et al.* (2014), records management which is a facet of inventory control significantly

drives procurement performance. Dettoratus *et al.* (2013) contend that lots of inventory losses are incurred due to induced stock-outs inaccuracy in inventory. Tinggi and Kadri on the contrary used regression and correlations to show that material flow management correlates positively with firm performance.

4.8.3 Effect of buyer -Supplier Relationship management on Performance

Hypothesis **H₀₃** postulated that customer-supplier relationship had no significant effect on performance. The hierarchical multiple regressions results presented in Table 4.22 revealed that customer-supplier relationship positively and significantly affects performance of textile firms in Nairobi City County ($\beta = 0.429$, $P < 0.05$). The implication of regression coefficient value of 0.429 is that a unit standard deviation increase in buyer-supplier relationship management leads to an increase of 0.429 standard deviations in performance when the other determinants are held constant. The hypothesis that customer-supplier relationship had no significant effect on procurement performance was therefore not supported.

Once again, the regression analysis results mirror the descriptive and thematic analyses results in recognizing the importance of close relations between supply chain partners. Textile firms have taken measures to maintain close and mutual relationship with their suppliers. The finding showing the positive effect of customer-supplier relationship is consistent with several others (Korir, 2015; Imeleny, 2014; Kamau, 2013).

Korir (2015), for instance argues that commitment, cooperation, communication and trust which are core elements of buyer-supplier relationship management are significant predictors of organizational performance particularly in large organizations. Imeleny (2014) posits that buyer-supplier relationship positively affects service delivery and therefore by consequence, organization performance. Kamau (2013) concludes that there exists a significant relationship between buyer-supplier relationship and performance signified by a coefficient of determination of 0.723.

The descriptive findings showing existence of partnership initiatives and information sharing among textile firms in Nairobi City County supports findings by Ideet and Wanyoike (2014) indicating that trust, information sharing, and partnership initiatives are key customer-supplier indicators that influences performance of Geothermal companies. The present study therefore argues that the same indicators are equally necessary for performance of textile firms.

The finding showing that lack of transparent processes when sourcing for suppliers, delayed supplier payments, and contractual conflicts are key buyer-supplier relationship challenges reflects findings by Gumboh and Gichira (2015) that point to trust, culture and honesty as major barriers to collaborations among SMEs in Kenya.

Findings in the present study showing that partnership initiatives, commitment and consistency in relationships are considered critical for firm performance supports findings that indicate that strategic partnership with suppliers enhances collaborations in the design of products and hence overall performance (Watiri & Kihara). Moreover the findings are in tandem with findings by Nyamasege and Biraori (2015) showing that management of supplier relationships tends to determine effectiveness of supply chains.

4.8.4 The Effect of Transport Management on Performance

Hypothesis **H₀₄** stated that transport management had no significant effect on performance. To test this claim, hierarchical multiple regressions model was used where transport management together with the other four determinants were entered in the second model.

The regression coefficients displayed in Table 4.22 indicates that transport management positively and significantly predicts firm performance ($\beta = 0.140$, $p < 0.05$). This implies that when the other four determinants are held constant, an increase of a unit standard deviation in transport management is likely to increase performance by 0.140 standard deviations.

The hypothesis that transport management has no significant effect on firm performance was therefore rejected. The implication is that managing transport in supply chains has a direct effect on performance of textile firms. Similar findings were found from interviews with heads of departments who clearly indicated that in an endeavour to manage transport, firms among other practices; centralized transportation data; integrated the transportation process; and adopted a holistic approach to transportation data.

The finding in this study that transport management directly affects firm performance is consistent with findings previously established showing that managing transport in logistics firms influenced the performance of those firms in a positive way (Kithiia, 2015). The present study therefore adds to existing findings by Kithiia by showing that the same can be realized from the textile context. Moreover, the finding confirms that poor performance of textile firms could be attributed to poor management of transportation in the supply chains.

The finding that transport management positively and significantly affects performance of textile firms in Nairobi City County adds to existing literature which does not take the textile industry into consideration. Mukolwe and Wanyoike (2015) for instance found that transport management and specifically the practices used for physical distribution improved the flow of materials and goods. The present study adds to the findings by Mukolwe and Wanyoike by identifying strategies such as centralization of transportation data, integration of transportation processes, and approaching transport management from a holistic perspective which other firms could also apply.

The finding in the present study showing that increased customer service and identification of new delivery opportunities accrue from transport management perhaps explains why transport management positively impacts on performance. Studies show that lead times in terms of production, shipping, the TAT time for customs brokerage, and the velocity for inspection of goods directly and significantly affects performance (Ndubi, Iravo & Ochiri, 2016).

4.8.5 The Effect of Warehouse Management on Performance

Hypothesis **H₀₅** posited that warehouse management had no significant effect on organizational performance. The hierarchical multiple regressions results presented in Table 4.22 revealed that warehouse management positively and significantly affects performance of textile firms in Nairobi County ($\beta = 0.273$, $P < 0.05$). The implication of these results is that when the other four factors are held constant, an increase of 1 standard deviation in warehouse management potentially improves firm performance by 0.273 standard deviations. The hypothesis that warehouse management had no significant effect on performance was therefore not upheld.

The various mechanisms put in place to manage warehousing as established through the descriptive and thematic analyses are consistent with the regression finding showing that managing warehousing can contribute significantly towards firm performance. Use of diverse practices such as product scanning, freight consolidation, and real-time data management is a clear manifestation that textile firms endeavor to optimize management of warehousing having realized the significant influence of warehouse management on firm performance. Investing in such practices is clearly compatible with the desire to maximize firm performance.

These findings reflect others in existing literature that point towards the direct influence of warehouse management on performance (Mukolwe & Wanyoike, 2015; Wambua, *et al.*, 2015; Karimi & Namusonge, 2014). According to Mukolwe and Wanyoike (2015), automation of warehouse management activities enhances required accuracy, operational speed and limit wastage. In essence therefore, finding showing that some textile firms face warehouse automation challenges should be of concern to management of those firms if they have to continue performing in the competitive market. Wambua *et al.* (2015) contend that inventory warehousing systems significantly and positively affect financial performance of seventh day Adventist institutions. The implication is that such systems can also improve financial performance of textile firms. Karimi and Namusonge (2014) on the other hand observe that use of technology has a positive effect on warehouse management.

4.9 Modeling Organizational Performance as a Function of Supply Chain Determinants

The overall model that relates performance of the textile firms to the conceptualized supply chain determinants namely: supply chain information systems, inventory management, buyer-supplier relationship, transport management, and warehouse management was therefore as follows:

$$Y = 0.223SCIS + 0.180IM + 0.429BSRM + 0.140TM + 0.259WM + 0.173$$

From table 4.20, it is clear that buyer-supplier relationship management($t = 5.537$) was the main determinant of firm performance among the conceptualized supply chain determinants. This was followed with warehouse management($t = 3.454$) and then, supply chain information systems($t = 3.442$), inventory management ($t = 2.697$), and finally, transport management($t = 2.449$) in that order.

4.10 Moderation Effect of Background Characteristics on the Relationship between Supply Chain Determinants and Organizational Performance

Hypothesis **H₀₆** posited that background characteristics do not influence the relationship between supply chain determinants and organizational performance. To assess the moderating effect of background characteristics, the following model was used.

$$OP = aSCD + bBC + cZSCD * ZBC + \varepsilon$$

Where;

$OP \Rightarrow$ Organizational performance

$SCD \Rightarrow$ Supply chain determinants

$BC \Rightarrow$ Background characteristics

$SCD * BC \Rightarrow$ Interaction between supply chain determinants and background characteristics

$a \Rightarrow$ Main effects of supply chain determinants on organizational performance

$b \Rightarrow$ Main effects of background characteristics on organizational performance

$c \Rightarrow$ Moderation effects of background characteristics on the relationship between supply chain determinants and organizational performance.

$\varepsilon \Rightarrow$ Regression residuals

The study therefore tested the interaction between supply chain determinants and background characteristics. Hierarchical regression analysis was used by first entering supply chain determinants variable and background characteristics variable in step 1 and then entering their interaction variable (ZSCD * ZBC) in step 2. A significant change in the R-square value signified existence of moderating effect.

Results shown in Table 4.23 indicate that the change in R-square value was very minimal (0.002) when the interaction variable was entered in step 2. These results imply that background characteristics do not moderate the relationship between supply chain determinants and organizational performance.

Table 4.23: Model Summary^c

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
					R Square Change	F Change	df1	df2	Sig. F Change	Durbin-Watson
1	.852 ^a	.725	.720	.27927	.725	135.982	2	153	.000	
2	.853 ^b	.728	.720	.27943	.002	.882	1	152	.350	1.554

a. Predictors: (Constant), BC, SCD

b. Predictors: (Constant), BC, SCD, ZBC*ZSCD

c. Dependent Variable: OP

Further examination of the regression weights displayed in Table 4.24 confirms that whereas the main effects of supply chain determinants on organizational performance amounted to 0.851, the main effects of background characteristics amounted to a mere -0.023. At the same time, the moderation effects of background characteristics on the relationship between supply chain determinants and organizational performance was negligible (-0.049).

Table 4.24: Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		t	Sig.
	B	Std. Error	Beta			
1 (Constant)	.680	.271			2.515	.013
SCD	.878	.053	.850		16.421	.000
BC	-.018	.054	-.017		-.334	.739
2 (Constant)	.688	.271			2.539	.013
SCD	.879	.054	.851		16.429	.000
BC	-.024	.054	-.023		-.443	.659
Interaction	-.024	.026	-.049		-.939	.350

a. Dependent Variable: OP

The moderation model was therefore as shown.

$$OP = 0.851SCD - 0.023BC - 0.049cSCD * BC + 0.272$$

The study findings showing that background characteristics do not moderate the relationship between supply chain determinants and organizational performance are consistent with others in extant literature. Flanigan *et al.* (2017) for instance found that experience and age do not moderate the relationship between leadership and performance. Indeed most studies point to background characteristics as having direct impacts on organizational performance rather than play moderating roles (Grimm & Smith as cited in Flanigan *et al.*, 2017; Magoshi & Chang, 2009; Sakuda, 2011).

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summarized results of the study together with conclusions and recommendations for management and policy. The study therefore examined views of employees and heads of section of all sections involved in the supply chain on existing frameworks for implementation of the conceptualized determinants and prevailing performance levels.

5.2 Summary Findings

The overall objective of the study was to investigate the influence of supply chain determinants on organizational performance among textile manufacturing firms in Kenya. The main findings of the study were: one that variation in the five determinants namely; supply chain information systems, inventory management, buyer-supplier relationship management, transport management, and warehouse management accounted for 82.7% of the variation in organization performance. The second key finding was that background characteristics do not moderate the relationship between supply chain determinants and organizational performance. The summary of findings focuses on the specific objectives that guided the study.

5.2.1 The Effect of Supply Chain Information Systems on Organizational Performance among textile manufacturing firms in Kenya

The first objective of the study sought to find out whether use of supply chain information systems in the supply chain affects performance of textile firms located in Nairobi City County. The study revealed that textile firms in Nairobi City County have put in place a number of supply chain information systems that include; Material Requirement Planning, Enterprise Resource Planning, Procurement and Freight and Resource Auctioning, Warehouse Management System, Transport Management System, and Real time Track and Tracing system.

Narratives from heads of sections revealed that central coordination, process efficiency and expenditure transparency were the priority goals that informed use of supply chain information systems. Through multiple regression analysis, the study established that supply chain information systems were positive and significant determinants of performance. Consequently, use of supply chain information systems has potential to improve organizational performance of the textile manufacturing firms. In essence, the study revealed that textile firms use an array of information systems in their functions and this has potential to impact positively in their overall performance.

5.2.2 Effect of Inventory Management on Organizational Performance among textile manufacturing firms in Kenya

The second objective sought to find out how the management of inventory affects performance of textile firms in Nairobi City County. Descriptive analysis of employees' responses revealed that the firms have put in place several inventory management mechanisms such as achievement of demand forecasting to determine stock coverage; proper material handling to address stock out; timely response to customer references; ensuring inventory accuracy; optimizing capacity utilization; and achieving optimal inventory.

Qualitative analysis of heads of sections responses revealed that in order to maximize inventory and material flow, the firms use holistic analysis, forecasting, and inventory segmentation strategies. In addition, all heads of sections interviewed indicated that the firms had implemented current and modern material flow systems such as Enterprise Resource Planning (ERP); Vendor Managed Inventory (VMI); Economic Order Quantity (EOQ), Just-in-Time approach, Radio Frequency Identification (RFI); and Oracle Application Implementation. The study also found out that inventory management positively and significantly affects organizational performance in textile firms in Nairobi City County. In addition it was found that among the four conceptualized drivers, material flow management was the second best predictor of organizational performance.

5.2.3 Effect of Buyer–Supplier Relationship management on Organizational Performance among textile manufacturing firms in Kenya

The third objective focused on examining the effect of buyer-supplier relationship on performance among textile firms in Nairobi City County. The study, through employee's questionnaire established that textile firms in Nairobi County are aware to the relevance of buyer-supplier relationship management. As a consequence of this, firms have among other positive moves; maintained strong relationships with suppliers; maintained regular appraisals of suppliers; undertaken to share risks mutually with suppliers; and continued to share information frequently with suppliers.

Findings from the narratives of heads of sections confirmed that firms consider attributes such as supplier capability, commitment, and consistency which border on trust, when settling on potential suppliers. Among the major challenges that lead to distrust and strained buyer-supplier relationship management were identified as lack of transparent processes when sourcing for suppliers, delayed supplier payments, and contractual conflicts. Multiple regressions analysis revealed that buyer-supplier relationship management was a positive and significant predictor of organizational performance.

5.2.4 Effect of Transport Management Organizational Performance among textile manufacturing firms in Kenya

The fourth objective focused on establishing effect of transport management on the performance of textile firms in Nairobi City County. The study revealed that the firms have in place a variety of transport management mechanisms that include; sufficient transport units; vehicle scheduling; route planning; disposal policy; fleet management; and tracking. Moreover, narratives from heads of supply chain sections revealed that centralizing transportation data, integration of the transportation process, and using a holistic approach to transportation data were used by the firms as transport management strategies. The study further revealed that transport management positively and significantly predicts organizational performance.

5.2.5 Effect of Warehouse Management on Organizational Performance among textile manufacturing firms in Kenya

The fifth objective focused on examining the effect of warehouse management on organizational performance of textile firms in Nairobi City County. The study, through employee's questionnaire established that textile firms in Nairobi City County have established practices such as availability of enough warehouses; automating warehousing activities; efficiency of warehousing activities; timely delivery of orders as per customer requested date; perfect picking, packing and shipping of lines; and optimizing total warehousing cost that they use to optimize warehousing.

Findings from the narratives of heads of sections confirmed that firms use practices such as product scanning, freight consolidation, real-time data management, and strategic consultation. Among the major challenges that firms face in warehousing were identified as automation of inventory, inventory location, warehouse layout, and picking optimization. Multiple regressions analysis revealed that warehouse management was a positive and significant predictor of organizational performance reflecting others in existing literature.

5.2.6 Moderating Effect of background Characteristics on the Relationship between Supply Chain Determinants and Organizational Performance

The sixth objective focused on examining the moderating effect of background characteristics on the relationship between supply chain determinants and organizational performance. The study, through staff involved in the textile supply chain established that background characteristics do not moderate the relationship between supply chain determinants and organizational performance among textile firms in Nairobi City County. Previous findings have also tended to rule out moderation effects of background characteristics.

5.3 Conclusions

In view of the findings made, the following conclusions were made

5.3.1 Effect of Supply Chain Information Systems on organizational performance among textile manufacturing firms in Kenya

Supply chain information systems determine performance in textile firms in Nairobi City County. The firms have taken cognizance of this fact and have therefore invested in various supply chain information systems in their functions, in order to cut operational costs and to remain competitive. Their efforts are however being hampered by challenges related to lack of enabling ICT infrastructure, lack of expertise, and lack of adequate funds.

5.3.2 Effect of Inventory Management on organizational performance among textile manufacturing firms in Kenya

Inventory management is a supply chain determinant of performance. Textile firms in Nairobi City County appear to be conscious of the importance of inventory management in the supply chain and have put clear mechanisms in place and invested in current material flow systems to oversee smooth and transparent material flow that can be tracked along a supply chain. Systems such as ERP, VMI, EOQ, and RFI have potential to optimize inventory and material flow.

5.3.3 Effect of Buyer-Supplier Relationships management on organizational performance among textile manufacturing in Kenya

Buyer-supplier relationship management is also a supply chain determinant of performance. Textile firms in Nairobi City County have therefore set out to improve relationships by investing in among others; strong ties with suppliers and customers; regular appraisals of suppliers; sharing risks mutually with suppliers and customers; sharing information frequently with suppliers and customers. These are positive efforts that seek to nurture trust and which could translate into improved performance in the supply chain functions. Distrust as a result of lack of transparency in processes, delayed supplier payments, and contractual conflicts tends to strain relationships.

5.3.4 Effect of Transport Management on organizational performance among textile manufacturing firms in Kenya

The researcher also concludes that transport management is a supply chain determinant of performance and in view of this; textile firms in Nairobi City County have taken steps to put in place adequate mechanisms to address transportation of supplies and products. They have adopted vehicle scheduling, route planning, fleet management, and vehicle tracking for purposes of improved performance.

5.3.5 Effect Warehouse Management on organizational performance among textile manufacturing firms in Kenya

Warehouse management is a significant predictor of organization performance. Textile firms in Nairobi City County have taken note of this reality and have put in place mechanisms such as automation of warehouse activities in an endeavor to achieve efficiency in warehousing. The firms however face several challenges in terms of automation of inventory, location and layout.

5.3.6 Moderating influence of Background Characteristics on the Relationship between Supply Chain Determinants and Organizational Performance

The researcher concludes that in matters regarding the textile supply chain, background characteristics of the employees within sections directly involved in the chain may not necessarily influence the direction the performance of the specific organization takes. This however, could depend on the context and nature of study.

5.4 Recommendations of the Study

In view of the conclusions made above, the following managerial and policy recommendations were made.

5.4.1 Recommendations to the managers of textile manufacturing firms

The study established that supply chain information systems, inventory management, transport management, warehouse management and customer supplier relationship

positively influence organizational performance of textile manufacturing firms in Kenya. Therefore the study recommends that it would be appropriate for management to address challenges of ICT infrastructure, and also hire or outsource experts for purposes of consolidating the advantages information systems bring to the firms. There is also need for management to encourage continued use of modern inventory systems in order to optimize performance of the supply chain and by consequence overall performance of the firms.

Challenges facing customer-supplier relationship such distrust ought to be eliminated. Management should look to address issues of delayed payments to suppliers, contractual conflicts, and improve transparency in operations. Mechanisms for addressing transport are commendable and should be maintained and other systems that can improve transport management should also be introduced. Management should design ideal locations of warehouses and whenever possible address the issues of inventory automation and warehouse layout in order to improve services

5.4.2 Recommendations to policy makers

Based on the conclusions the researcher recognizes that manufacturing firms in Kenya plays a key role towards the achievement of vision 2030 and therefore recommends that policy makers in private and public entities such as Kenya association of manufacturers, Kenya revenue authority and Kenya bureau of standards should establish relationship to ensure that the policies which govern the manufacturing sector are utilized harmoniously. These policies include customs levies, exportation and importation regulations and quality standardization. The findings show that variation in the five supply chain determinants namely; supply chain information systems, inventory management, customer-supplier relationship, transport management, and warehouse management accounts for 82.7% of the variation in firm performance, the remaining 17.3% un-explained variation in performance is significant enough that policy formulation should incorporate all stakeholders in order to identify other potential determinants.

5.5 Areas for Further Research

The study focused on five supply chain determinants of organizational performance which included supply chain information system, inventory management, transport management, warehouse management and customer supplier relationship. The finding that these determinants could not account for up to 17.3% of the variations in organizational performance calls for future research to interrogate other possible supply chain drivers. The current study was restricted to textile firms in Nairobi County. The findings may therefore have been influenced by the context in which this study was conducted. The researcher therefore recommends that similar studies should be replicated in textile firms in other regions so as to improve the external validity of the findings.

The contradictory nature of the finding that background characteristics do not moderate the relationship between supply chain determinants and organizational performance, is rather weighty and would require further scrutiny. Future studies should focus on examining moderating influence of specific characteristics within diverse study contexts.

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APPENDICES

Appendix I: Letter of Introduction

Dear Sir/Madam,

RE: COLLECTION OF DATA

I am a Doctor of Philosophy (PHD) candidate in the Department of Procurement and logistics, School of Human Resource and Development, Jomo

Kenyatta University of Agriculture and Technology. The purpose of the study is to evaluate the **Supply Chain determinants of organizational performance among textile manufacturing firms in Kenya: Moderating effect of background characteristics**. I'm therefore; seeking your assistance to fill the questionnaires attached which will take the shortest time possible. Kindly respond to all the Questions using your best estimates. The research results will be used for academic purposes only and will be completely confidential. Only summary results will be made public and only the institution is allowed to access these records. Should you have comments or questions regarding the study kindly contact **Enock Gideon Musau of P.O BOX 9363-30100, Eldoret; email: egiddy14@gmail.com**.

Thank you for your support and cooperation.

Yours sincerely,

Enock Gideon Musau

Student JKUAT.

Appendix II: Employee Questionnaire

SECTION ONE : DEMOGRAPHIC DATA

(Instruction -Tick where appropriate)

1. What is your gender?

Male

Female

2. Level of education?

Secondary Form Four

Certificate

Diploma

Graduate

Masters

PHD

3. What is your age bracket?

Below 30 years

31 - 40 years

41 -50 years

51 - Above

4. How long have you worked in the department?

- Below 1 year []
- 2- 5 years []
- 6-10years []
- 11-15years []
- Above 16 years []

SECTION TWO: PERFORMANCE OF TEXTILE MANUFACTURING FIRMS

Please indicate the extent to which you agree with the following performance indicators as observed in your firm. Use the scale: SD- Strongly Disagree, D – Disagree, MA-Moderately Agree, A –Agree, SA – Strongly Agree

Statements	SD	D	MA	A	SA
The firm has improved its corporate image					
The firm has achieved production efficiency					
Product quality has been improved					
There has been increase in profitability					
The firm has achieved higher returns on investment					
Material costs have reduced					
New market opportunities have been created					
The firm has become more reliable in operations					

SECTION THREE: SUPPLY CHAIN INFORMATION SYSTEMS

Please indicate the extent to which you agree with the following supply chain information communication technology issues within the textile manufacturing firms. Record your answer by ticking at the space provided, by the scale indicator; SD- Strongly Disagree, D – Disagree, MA-Moderately Agree, A –Agree, SA – Strongly Agree

Statements	SD	D	MA	A	SA
Material requirement planning (MRP) system is frequently used in this firm					
The firm uses the enterprise resource planning (ERP) system to manage its resources					
The firm uses the Procurement an Freight and Resource Auctioning (PFAS) system for its procurement functions					
The Warehouse Management System (WMS) is used to manage the firms warehouse					
The Warehouse Management System (WMS) is used to manage the firms warehouse					
Management of the firms transport needs is done using the Transport Management System (TMS)					
Tracking of goods and materials is made via the Real time Track and Tracing system					
Invoicing and fund transfer are conducted electronically					
Information systems have been put in place to support decision making					
Interdepartmental communication is effectiveThe firm has invested in information communication systems					

SECTION FOUR: INVENTORY MANAGEMENT

Please indicate the extent to which the following waste inventory management issues are implemented in textile manufacturing firm. Please record your answer by ticking at the space provided, by the scale indicator; SD- Strongly Disagree, D – Disagree, MA-Moderately Agree, A –Agree, SA – Strongly Agree

Statements	SD	D	MA	A	SA
The firm achieves accurate demand forecasting to determine stock coverage					
The firm has put in place proper material handling in cases of stock out					
The firm makes timely response to customer references to ensure stock availability					
The firm has mechanisms in place to ensure inventory accuracy					
The firm optimizes utilization of its capacity					
The firm achieves optimal inventory					

SECTION FIVE: TRANSPORT MANAGEMENT

Please indicate the level to which you agree with the following statements relating to transport management within the textile manufacturing firm. Please record your answer by ticking at the space provided below, by the scale indicator; SD- Strongly Disagree, D – Disagree, MA-Moderately Agree, A –Agree, SA – Strongly Agree

Statements	SD	D	MA	A	SA
There are sufficient transportation units in the firm					
Current vehicle scheduling practices have improved transportation of materials and produce					
The firm conducts thorough route planning					
The firm has in place a clearly defined disposal policy					
The firm has a system in place for managing its fleet					
The firm has installed a tracking system					
The firm undertakes preventive maintenance					
The firm has a vehicle inspection schedule					

SECTION SIX: BUYER -SUPPLIER RELATIONSHIP MANAGEMENT

Please indicate the extent to which the following buyer supplier relationship management issues are handled within the textile manufacturing firms. Provide your answer by ticking at the space below, by the scale indicator; SD- Strongly Disagree, D – Disagree, MA-Moderately Agree, A –Agree, SA – Strongly Agree

Statements	SD	D	MA	A	SA
The firm frequently communicates with its customers and suppliers					
Information sharing improves the firm's processes					
Trust leads to high levels of satisfaction in the firm					
Partnership initiatives reduces risks of competing product introduction					
Reduces the product design cycle time					
The firm provides customers with information about manufacturing process					
The firm shares risks mutually with its customers and suppliers					
Frequent information sharing					
There is a strong relationship between the firm and its customers					
The firm appraises its suppliers regularly					

SECTION SEVEN: WAREHOUSE MANAGEMENT

Please indicate the extent to which the following Warehouse management issues are handled within the textile manufacturing firm. Provide your answer by ticking at the space below, by the scale indicator; SD- Strongly Disagree, D – Disagree, MA- Moderately Agree, A –Agree, SD – Strongly Agree

Statements	SD	D	MA	A	SA
There are enough warehouses					
Shutting down of the firm does not affect material supply					
Most warehousing activities are automated					
Warehousing activities have improved efficiency					
Orders are delivered on time per customer requested date					
Orders are usually filled completely on first shipment					
Lines are picked, packed and shipped perfectly					
Orders are delivered without changes, damage or invoice errors.					
Order are picked, packed and shipped perfectly					
The firm optimizes total warehousing cost					

Appendix III: Interview Schedule for Heads of Departmental Units

The Kenyan Textile supply chain has been facing challenges related to its management (Tuigong & Kurgat, 2015). The following items relate to topical areas related to supply chain management and organization performance. Please provide your candid views with respect to each of the items.

Question one

- a) What are the main priority goals that you base on when deciding to use supply chain information systems in supply chain functions?
- b) Identify challenges you as a department experience in using information systems in supply chain functions

Question two

- a) Identify strategies the firm uses to optimize inventory and material flow.
- b) What practices have you put in place to manage inventory
- c) Has the firm implemented current inventory management systems?

Question three

- a) Identify supplier attributes that strengthens the firm's relationship with suppliers
- b) What factors lead to strained relationships between you and your suppliers?

Question four

- a) Identify strategies your firm uses to manage transport in the textile supply chain
- b) Which benefits accrue from adoption of transport management systems?
- c) What challenges does this firm face in transport management?

Question five

- a) Which are the main warehouse management practices used by the firm?
- b) What challenges does this firm face in managing warehouses?

APPENDIX IV: TEXTILE MANUFACTURING FIRMS IN KENYA

S/NO	FIRM	LOCATION
1	Afro Spin Ltd	NAKURU
2	Alpha Knits Limited	THIKA
3	Bedi Investments Ltd	NAKURU
4	Bhupco Textiles Mills Ltd	THIKA
5	Fine Spinners Ltd	NAIROBI
6	Heritage Woolen Mills	ELDORET
7	Jaydees Knitting Factory Ltd	NAIROBI
8	Kamyn Industries Ltd	MOMBASA
9	Ken Knit Textile	ELDORET
10	Kifaru Textile Mills	NAIROBI
11	Lamsons Industries Limited	NAKURU
12	Londra Limited	NAKURU
13	Mega Spin Ltd	NAKURU
14	Midco Textiles (EA) Ltd	NAIROBI
15	Mombasa Towel Manufacturers Ltd	MOMBASA
16	Mount Kenya Textiles Ltd	NANYUKI
17	Nakuru Fibres Ltd	NAKURU
18	Nakuru Industries Ltd	NAKURU
19	Nanyuki Spinners & Weaving	NANYUKI
20	Nyali Textiles Mills	MOMBASA
21	Nyanza Spinning and Weaving Mill	NANYUKI
22	RIVATEX	ELDORET
23	Rupa Cotton Mills EPZ Ltd	NAIROBI
24	Shawaz Textile Mills	NAIROBI
25	Silver Star Manufacturers Ltd	NAIROBI
26	Spin Knit Limited	NAKURU
27	Spinners & Spinners Ltd	RUIRU
28	Summit Fibres Ltd	MOMBASA

29	Sunflag Textile & Knitwear Mills Ltd	NAIROBI
30	Thika Cloth Mills Ltd	THIKA
31	TSS Spinning & Weaving Ltd	ATHI RIVER
32	United Textile Industries Ltd	NAIROBI
33	Apparel Africa Ltd	MOMBASA
34	Apparels Trading Co Ltd.	NAIROBI
35	Bedi Investments (Export) Ltd	NAKURU
36	Crown Fashions Ltd	NAIROBI
37	Eagle Apparel Export Ltd	NAIROBI
38	Emke Garment Kenya Pv Limited	MOMBASA
39	Equator Apparels Co. Ltd	NAIROBI
40	Falcon Apparel Exporters Ltd	NAIROBI
41	Freba International Mall Ltd	NAIROBI
42	Heritage Woolen Mills Ltd	ELDORET
43	Kibingo Textiles Ltd	KERUGOYA
44	Leena Apparel Ltd	NAIROBI
45	Manchester Apparels Ltd	NAIROBI
46	Maridadi Apparels Ltd	NAIROBI
47	Mash Apparels Kenya Ltd	NAIROBI
48	Mega Spin Ltd	NAKURU
49	Res Apparels Ltd	NAIROBI
50	Riziki Manufacturers Ltd	NAIROBI
51	Sankam Textiles Ltd	NAIROBI
52	StormApparel Manufacturers Ltd	NAIROBI
53	Teleworld Industries Ltd	NAIROBI
54	Triaco Fine Textile Products	NAIROBI
55	Zawadi Apparels Ltd	NAIROBI