

**LEAN PRACTICES AND OPERATIONAL  
PERFORMANCE OF THIRD PARTY PORT-  
CENTRIC LOGISTICS FIRMS IN KENYA**

**KINGSFORD MURIITHI RUCHA**

**DOCTOR OF PHILOSOPHY  
(Supply Chain Management)**

**JOMO KENYATTA UNIVERSITY OF  
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**Lean Practices and Operational Performance of Third Party Port-  
Centric Logistics Firms in Kenya**

**Kingsford Muriithi Rucha**

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## DECLARATION

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

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

**Kingsford Muriithi Rucha**

This thesis has been submitted for examination with our approval as University Supervisors.

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

**Prof. Robert Gichira, PhD**

**JKUAT, Kenya**

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

**Prof. Kenneth Wanjau, PhD**

**Karatina University, Kenya**

Sign: \_\_\_\_\_ Date: \_\_\_\_\_

**Prof. James Muranga Njihia, PhD**

**UON, Kenya**

## **DEDICATION**

This thesis is dedicated to my wife Juliana Whonge, my daughter Rozie Kangai Rucha, my son Maxwell Cherera Rucha and my last born angel Nadine Kawendo Rucha. They have been my greatest source of motivation, inspiration and encouragement through the challenging journey of this work. God bless you immensely my dear ones.

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## **LIST OF ABBREVIATIONS AND ACCRONYMS**

<b>3PL</b>	-	Third Party Logistics Firms
<b>BRTF</b>	-	Better Regulation Task Force in UK
<b>GM</b>	-	General Motors
<b>JIT</b>	-	Just in Time
<b>KEBS</b>	-	Kenya Bureau of Standards
<b>KEPHIS</b>	-	Kenya Plant Health Inspectorate Services
<b>KIFWA</b>	-	Kenya International Freight and Warehousing Association
<b>KNJE</b>	-	Kenkyusha's New Japanese-English Dictionary
<b>KPA</b>	-	Kenya Ports Authority
<b>KRA</b>	-	Kenya Revenue Authority
<b>MIT</b>	-	Massachusetts Institute of Technology
<b>MMR</b>	-	Moderated Multiple Regression
<b>OECD</b>	-	Organisation for Economic Co-operation and Development
<b>SBP</b>	-	Small Business Project: <a href="http://www.sbp.org.za">www.sbp.org.za</a>
<b>SCOR</b>	-	Scorecard and Supply Chain Operations Reference (SCOR)
<b>SME</b>	-	Small and Medium Enterprises
<b>TPS</b>	-	Toyota Production System

## **OPERATIONAL DEFINITION OF KEY TERMS**

**Cost Management:** Cost management focuses on the ability to effectively manage operations or production cost, including all related aspects such as overheads, inventory costs and value-addition costs (Zhao, Xie, & Leung 2002). Despite the focus on lowering cost, this strategy does not mean that the organization should compromise quality. On the contrary, firms must actually adventure on routes towards simpler, less costly, automated and reengineered ways of doing business that advocates for efficient and effective production.

**Customer/Market Orientation:** Customer-oriented 3PL firms are specialist providers of a wide range of logistics activities and are well-recognized as key enablers of their customers' service-related competitive advantages in developed economies (Panayides, 2007). Deshpande, Farley and Webster (1993) posits that market orientation refers to a set of beliefs that puts the customer's interest first, while not excluding those of all other stakeholders such as owners, managers and employees, in order to develop a long term profitable enterprise logistics enterprise. Panayides (2007) argues that 3PL customer orientation is in synch with first lean management guiding principles which largely captures the spirit of this study.

**Lean Practices:** Lean practices refers to all the interventions and undertakings whose aim is to optimize use of available resources in order to minimize waste (Anand & Kodali, 2009) creating high-quality goods and services at the lowest possible cost and with maximum customer responsiveness (Dora, Goubergen, Kumar, Molnar & Gellynck, 2014). The practices are traced back to the initial Toyota Production System practice with the expansion of the concept to address the changing global production outlook, particularly with growing relevance in services.

**Logistics:** logistics as a term that refers to the management functions that support the complete cycle of materials flows from the purchase and the internal control of work in progress to the purchasing, shipping and distribution of the finished products (Chase, Shankar, Jacobs & Aquilano, 2010). It is also to the process of planning, implementing and controlling the efficient flow and storage of goods, services and related information from point of origin to point of consumption for the purpose of conforming to customer requirements (Motari, 2002). Logistics theme provided by Chase et al. (2010) is consistently pursued and adopted by the study.

**Operational Performance:** Operational Performance is defined as the degree to which an operation fulfills the five generic objectives of quality, speed, dependability, flexibility, and cost (Slack, Johnston & Brandon-Jones, 2016). It is a management discipline that is involved with the optimum transformation of inputs into outputs in the most efficient way. Operational performance is conceptually defined and explained as competitive priorities (quality, flexibility, cost and dependability) of operations strategy (Wang, Huo, Fujun & Chu, 2010). This study uses the Hayes and Wheelwright model in conceptualizing operational performance.

**Regulation:** Regulation are any government or industry backed measures or interventions that seek to change the behaviour of individuals or groups. Regulation is: “[...] a set of ‘incentives’ established either by the legislature, Government, or public administration that mandates or prohibits actions of citizens and enterprises [...]. Regulation are supported by the explicit threat of punishment for non-compliance” [Organisation for Economic Co-operation and Development (OECD), 1994].

**Service Quality:** In a study on cross-cultural influences on quality management systems, Low (2010) defines quality as the predictable degree of uniformity and reliability at a cost that will deliver a price that the customer is willing to pay for or suited to the market niche the firm is operating in. In logistics, service quality translates into strategies aiming at making order cycle times shorter and more predictable, as well as maintaining certain levels of in-stock availability and certain fill rates on customer orders (Choi & Rungtusanatham, 1999). The perspective advocated by Low (2010) and Choi and Rungtusanatham (1999) in regard to quality of logistics services synchs well with this study.

**Third Party Logistics Firms:** Third-party port-centric logistics (3PL) firms are those firms involved in the movement of cargo to and from the port as well as all other related tasks such as import/export document processing, cargo inspection, security provision weighing among others (Chase et al., 2010; Le Dam, 2003).

**Waste Management:** Waste is defined as anything that interferes with the smooth flow of production. The eight wastes highlighted in Toyota Production System are overproduction, waiting, conveyance, over processing, excess inventory, movement, defects and unused employee creativity, and overproduction (Wee & Simon, 2009). The position taken by Wee and Simon Wu (2009) resonates well with the waste management as advanced in this study.

## ABSTRACT

This research explored lean practices and operational performance of third-party port-centric logistics (3PL) firms in Kenya by looking at the concept from its original proponents in Toyota Production system to the current applications in services. The study tested conceptual model of the relationship between lean practices and operational performance which was moderated by general regulation. Lean concept in this study was conceptualized within four groups of issues, that is, quality management, reduction of waste, customer orientation and total-cost reduction which were also used to generate the specific objectives of this study. Port-centric logistics services business is highly regulated in Kenya and thus it was critical to find out the effect the regulatory framework had on the relationship between lean and operational performance of these firms. A survey design based on stratified sampling with a disproportionate approach consisting of 164 firms (15% of the population) was used in data collection using the 164 semi-structured questionnaires targeting 164 third party port-centric logistics firms. Response rate for this study was 75.6% (124 firms). Data analysis was carried out using moderated multiple regression (MMR) model and relationship between the variables computed. Using the data collected, test of internal consistency, validity test, reliability and normality test, were conducted, all indicating appropriateness of data. The strength of the regression model was found to be 88.2% (adjusted  $R^2$ ) which was considered good enough, appreciating the fact that operational performance is also affected by other factors outside the model. Null hypotheses ( $H_{01}$ - $H_{04}$ ) were tested and rejected with a strong statistical significance that lean practices explored in this study influenced operational performance. Moderation results indicated a statistically significant moderation effect of regulation on the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya with  $R^2$  change of 1.6% at  $p=0.000$ . The findings of this study immensely provides information and knowledge that will play a critical role in research agenda in the area of lean and operational performance, particularly in service management. The study proposes policy formulation that supports measures that boost and reinforces (without inhibiting) performance in 3PL firms. Consequently, this study provides critical information, knowledge, foundation and an elevation from where a research agenda and policy discussions can be referenced. This study recommends

policy formulation that will support measures to boost and 3PL firms' continuous growth in terms of fundamentals and quality services for the interest of both micro and macro-economics. This will help in creating 3PL firms that are efficient, effective and with superior operational performance, first to the benefit of the customers (importers and exporters), and to the entire national economy and eastern Africa at large.

## **CHAPTER ONE**

### **INTRODUCTION**

Lean concept was first defined by Krafcik (1988) while creating the book, “The Machine that Changed the World” on the Toyota Production System (TPS). Lean management philosophy’s aim is optimized use of available resources in order to minimize waste (Anand & Kodali, 2009) and creation of high-quality goods and services at the lowest possible cost with maximum customer responsiveness (Dora et al., 2014). In order to address the changing customer needs and expectations, technological advancements and innovations, producers are forced to develop lean capabilities in order to cope with the dynamic environments (Saleeshya et al., 2013). Lean also requires keeping far less than half the needed inventory on site, results in many fewer defects, and produces a greater and ever growing variety of products (So & Sun, 2010, Papadopoulou & Özbayrak, 2005).

This study was anchored on four theoretical standpoints; Contingency Theory which acknowledges that organizations are not closed systems, they are permanently exposed to contingency factors that should be considered at the time of choosing their strategies (Hofer, 1975); The Resource Based View whose proponents argued that superior firm performance is the ability of firms to accumulate resources and capabilities that are rare, valuable and difficult to imitate (Barney, 2000); Institutional Theory delves into how the organization social structures are created, diffused, adopted, and adapted over space and time; and how they fall into decline and disuse (Scott, 2004) and finally Customer value theory which maintains a firm’s view that a market-oriented organization will carefully apply its resources and competencies to create superior innovative value propositions for its customers (Ketchen, Rebarick, Hult & Meyer, 2008).

Third Party (3PL) port-centric logistics firms are those firms involved in the management, control and delivery of logistics activities on behalf of a shipper by an external provider (Lynch, 2005). In the Kenyan perspective, third party logistic players include: The shippers who are the key players in logistics across borders, the



transporters or drayage contractors who are hinterland logistics players and finally the Freight Forwarders/Customs Brokers.

### **1.1.1 Global Perspective of Lean Practices**

Massachusetts Institute of Technology (MIT) is largely credited with providing a clearer understanding and promoting the lean thinking. According to the Production System Design Laboratory of MIT [Massachusetts Institute of Technology (MIT), 2000], the aim of lean production was to eliminate waste in every area of production including customers' relations, product design, suppliers' networks and factory management. Its goal is to incorporate less human effort, less inventory, less time to develop products, and less space to become highly responsive to customer demand while producing top quality products in the most efficient and economic manner possible (Hines, Holweg & Rich, 2004).

Lean practices are characterized by pull-production systems, which produces what is actually demanded by the customer at the necessary time and quantity. With regard to quality management, lean practices encourage mutual effort between participants who strive for continuous improvement and zero defects (Womack & Jones, 2003). Lean practice also advocates for set-up time reduction which is critical in any production system, be it production of services or manufacturing (Kannan & Tan, 2005).

A number of studies postulates that lean management has become a powerful approach in escalating operational performance in terms of quality, inventory minimization, delivery and productivity and cost. Surprisingly, lean management has also been recognized as a fantastic strategy to improve business performance in terms of profitability, sales and customer satisfaction (Fullerton & Wempe, 2009). The application of lean is in both manufacturing and services, whereby lean in services is a more topical concept compared to the widely known lean manufacturing. Womack and Jones (2003) formally introduced the term lean thinking that expanded lean manufacturing to include non-manufacturing processes indicating applicability of lean system to other processes than manufacturing.

Lean in services practice was introduced in the pioneering article followed by lean thinking concept towards the year 2000 (Suarez-Barraza, Smith & Dahlgaard-Park, 2012). The literature discussing lean service although dominant by conceptual and case studies (Holm & Ahlstrom, 2010), covers a wide range of service industries and rapidly develops over time. Bhasin (2011) posits that organisations on a lean journey must embrace lean as an ideology; when it embraces that this state exists, it enables them to reap the full benefits Lean professes to offer. In order to realize this study, a set of four lean practices were adopted which includes; quality management; waste management; customer orientation and cost management. Regulation is the moderation variable in determining the relationship between lean practices and operational performance in this study.

### **1.1.2 Lean Practices in Kenya**

Lean as a concept has been present and practiced by firms across manufacturing and service sectors alike in Kenya. A study conducted amongst companies in the sugar sector in Kenya on lean manufacturing tools revealed that these firms did not give attention to all the key areas of lean manufacturing from a holistic perspective instead a piecemeal approach was adopted. The study concluded that these firms lacked understanding of lean manufacturing concepts and have therefore not reaped full benefits of lean implementation (Kisombe, 2011). Shedrack (2013) conducted a study on lean supply chain management and organizational performance for manufacturing companies listed in Nairobi Securities Exchange. The study found out that most manufacturing companies listed in Nairobi Securities Exchange embraced lean supply chain management by use of cross-enterprise collaboration, lean supply chain technologies, Kaizen, workplace and system organization, lean warehousing, Kanban and demand management.

A study by Kanjejo (2012) on lean supply chain management practices at public universities in Kenya established that although lean concept was being adopted, rigid organizational culture and resistance to change among public universities was a major obstacle to successful implementation of lean supply chain management practices. Mbithuka (2009) conducted a study on Lean supply chain practices and supply chain

responsiveness among vegetable oil processing firms in Kenya. The results of the study showed that firms that had responsive supply chain experienced the advantage of improved lead time for innovative products life cycle, reduced costs/ increased revenue by optimizing inventory levels under demand uncertainty and superior supplier relationship. This was achieved through implementing quantity- flexible contacts that share risk among supply chain partners.

Macharia (2009) conducted a study on lean procurement and supply chain performance at safaricom limited established that Safaricom practiced lean procurement practices such as employee supplier-firm relationship, pull system, total quality management, continuous improvement and e-procurement. The study on “Lean manufacturing practices and performance of organizations listed at the Nairobi Securities Exchange” established less process waste, reduced inventory, reduced lead time, less rework, financial savings and increased process understanding as the benefits emanating from the implementation of lean manufacturing practices and critically the study identified external obstacles, logistic issues small supplier delivery difficulties and global issues as the major hindrances to lean manufacturing practices implementation (Openda, 2013).

### **1.1.3 Operational Performance**

Review of research on the practice of lean clearly show that when many organizations implement lean, they perform better and become more competitive as it reduces lead time and inventories, and cuts operating costs (Sharma, Dixit & Qadri, 2015). Generally there are two types of business performance; the operational performance and financial performance. Operational performance can be further classified into cost and service performances where service performance is commonly used to measure operational service performance in terms of the quality of the service, on-time delivery, and flexibility of the service (Wang et al., 2010; Daugherty, Chen, Mattioda & Grawe, 2009).

Lean production in both manufacturing and services has proven highly successful in elevating overall performance of manufacturing organizations (Panizzolo, Garengo, Sharma & Gore, 2012; Vinodh & Joy, 2012). To achieve waste reduction whose

success immensely feeds into the operational performance success, coordination of activities as well as the need to realign the financial goals with those that lean attempts to accomplish (Panizzolo et al., 2012). In the automotive industry for instance, by effectively designing and scheduling the movement of robots, and by eliminating unnecessary processes, significant improvements in cycle times were obtained, and therefore throughput time (Taj & Morosan, 2011). In measuring operational performance, this study adopted the operations competitive devices approach also known as the operations competitive priorities as advocated originally by Hayes and Wheelwright, (1984).

#### **1.1.4 Regulation**

In the past, a considerable interest has been generated regarding regulation and the regulatory environment for businesses such as Small Business Project [Small Business Project (SBP), 2004] identified an appropriate regulatory environment as the single most important element in an economic growth strategy essential for robust private sector development. Djankov, McLiesh and Ramalho (2006) posit that national economies with better regulation grow faster. Researchers at the World Bank quantify the potential benefits of better regulation. They show that improving from the worst quartile of business regulation to the best implies a 2.3 percentage point increase in annual economic growth (World Bank, 2008).

Regulation by itself refers to any government or industry backed measures or interventions that seek to change behaviour of individuals or groups and can give people rights (for example, equal opportunities) and restrict their behaviour (for example, compulsory use of seat belts) [Better Regulation Task Force (BRTF), 2003]. Third Party Port-Centric Logistics firms in Kenya operate in a tightly or closely regulated environment through the government agencies as well as through the member body, Kenya International Freight and Warehousing Association (KIFWA).

#### **1.1.5 Third Party, Port-Centric Logistics Firms in Kenya**

Third Party port-centric logistics (3PL) is the management, control and delivery of logistics activities on behalf of a shipper by an external provider (Lynch, 2005). Customer-oriented 3PL firms are specialist providers of a wide range of logistics

activities and are well-recognized as key enablers of their customers' service-related competitive advantages in developed economies (Panayides, 2007). In the Kenyan context, third party port-centric logistics players include: Shippers; who are key players in logistics across borders, Transporters or Drayage contractors; who are hinterland logistics players responsible for short haul movements from ship-side to port-terminals and customer locations.

These firms (3PL firms) are usually either contracted by the owners of the cargo directly or through agents. Others include: Freight Forwarders/Customs Brokers; who are licensed customs brokers who provide services in the areas of import and export. They also help in cargo consolidation and transportation globally using multi-modal freight forwarders. According to Kenya Revenue Authority listing obtained from department of customs, there are about 1064 registered clearing and forwarding firms in Kenya (KRA, 2016). All third party, port-centric logistics firms must be registered by Kenya Revenue Authority before they can obtain other operating licenses.

## **1.2 Statement of the Problem**

Many logistics services providers and indeed many other firms in different industries that have implemented and practicing lean in their operations have recorded positive outcomes (Bhasin, 2011). As well, there are also results indicating otherwise, that even after implementing lean, a number of other firms do not reap the full benefits lean proposes, with lean effort yielding little boost to performance (So & Sun 2010; Kisombe 2011). In addition to the challenge of stepping up performance through the practice of lean management, logistics services providers in Kenya operate in an environment that is highly regulated by multiple agencies such as KRA, KEBS, KPA, KEPHIS and KIFWA.

In Kenya, Logistics services providers sector is an important sector in the economy, calling for unwavering support in order to boost the overall performance of the country supply chain and competitiveness. The pit fall of inefficiency and ineffectiveness of such a sector like 3PL in a country is the constrained growth in both the micro and macro-economic sectors resulting in country's loss of competitive advantage. This is

so detrimental that it can eventually erode the entrepreneurial flexibility and innovativeness of firms in the entire economy due to escalation of the cost of doing business. When logistics and movement of merchandise in a country is not well managed, with logistical inefficiencies the norm, the end result is high product prices (excess of 35%) on consumer prices (Chase et al., 2010).

Many past studies on lean practices have documented a strong and a positive link between lean and operational performance (Chavez et al., 2013; Bhasin, 2011; Rahman, Laosirihongthong & Sohal, 2010; Chase et al., 2010). The need to carry out this study was driven by first, the need to check the direction and significance of the postulated relationship between lean and operational performance in the context of logistics services providers in Kenya and secondly, investigate the effect of the multifaceted regulatory framework on the performance of these firms. Furthermore studies conducted in Kenya, for example Oyiro (2017), Openda (2013) and Macharia (2009), by and large, did not address the influence of the moderation on the relationship between lean and performance. This study therefore sought to address this knowledge gap in order to answer the quest, what is the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya?

### **1.3 General Objective of the Study**

The general objective of this study was to examine the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya.

#### **1.3.1 Specific Objectives**

The specific objectives for this study were:

1. To determine the relationship between quality management and operational performance of third-party port-centric logistic firms in Kenya.
2. To find out the relationship between waste management and operational performance of third-party port-centric logistic firms in Kenya.
3. To establish the relationship between customer orientation and operational performance of third-party port-centric logistic firms in Kenya.

4. To assess the relationship between cost management and operational performance of third-party port-centric logistic firms in Kenya.
5. To evaluate how regulation moderate the relationship between lean practices and operational performance of third-party port-centric logistic firms in Kenya.

#### **1.4 Research Hypotheses**

This study was guided by a set of null hypotheses which were tested through statistical methods. The set of the null hypotheses for this study were as follows:

- H<sub>01</sub> There is no significant difference in the relationship between quality management and operational performance of third party port-centric logistics firms in Kenya.
- H<sub>02</sub> There is no significant difference in the relationship between waste management and operational performance of third party port-centric logistic firms in Kenya.
- H<sub>03</sub> There is no significant difference in the relationship between customer orientation and operational performance of third party port-centric logistic firms in Kenya.
- H<sub>04</sub> There is no significant difference in the relationship between cost management and operational performance of third party port-centric logistic firms in Kenya.
- H<sub>05</sub> There is no significant effect of regulation as a moderating variable on the relationship between lean practices and operational performance of third party port-centric logistic firms in Kenya.

#### **1.5 Justification of the Study**

The prime purpose of a lean strategy is to eliminate waste or muda (Tapping, 2006). Several research studies have shown that a lean strategy produces higher levels of quality and productivity and better customer responsiveness (Krafcik, 1998). It is worth mentioning that the impact of lean thinking as a strategy is important not only in manufacturing but also for the entire supply chain and third party port-centric logistics firms (3PL) are part of it. These firms are service oriented and the concept of

lean was started with the manufacturing firms, leaving service firms largely unexplored for long period of time. Service firms and indeed service products are unique in their own respect compared to goods.

Third party port-centric logistics firms help in cargo consolidation and transportation globally using multi-modal freight arrangements, thereby helping the import and export business in a country by interconnectivity between local firms and external/international customers through the critical port linkage. This does not only add impetus to the macro environment but also spurs growth in the micro-economy through growth of small and medium enterprises. These firms benefits by being able to access the external markets or by acquiring merchandise for sale in the local markets. This study benefits several groups:

#### **1.5.1 Academia**

The findings of this study are essential and very useful to the body of academia through the knowledge and information that was be generated. This is because it is the first study in the local context touching on third party port-centric logistics firms in Kenya.

#### **1.5.2 Policy Makers**

Policy makers such as the Ministry of Transport (MOT), Kenya Revenue Authority (KRA), Kenya Ports Authority (KPA) and others will find this study a useful piece of information and knowledge as they continue improving regulatory framework and strategies for port improvement and growth. Since the port does not engage directly in external operations, these logistics operations are carried out by third party logistics providers and therefore performance of these firms is critical.

#### **1.5.3 The Industry**

The industry players who include the third party port-centric logistics firms, the shipping firms, industry regulators such as KIFWA and KRA as well as Kenya Transporters Association are expected to use the results of analysis, information and knowledge generated by this study to transform the industry.



### **1.6 Scope of the Study**

This study involved only those logistics firms who in one way or the other are linked to the Kenyan seaport and registered in Kenya by Kenya Revenue Authority (KRA). In this study these firms are referred to as third party port-centric logistics firms in Kenya. The firms are scattered all over the country and engage in logistics services either directly or through other appointed logistics firms. The critical licensing agency for port-centric logistics firms in Kenya is KRA. This is because the businesses these firms engage in are import and export related on behalf of their clients which is highly regulated by the state. Out of 124 firms that participated in this study, 58.4% of them have been in operation for over ten years while 31.2% have been operation for between 5-10 Years. This representation was good enough owing to the fact that lean practices in services is a phenomenon whose upscale in uptake is trending embrace over a couple of years.

### **1.7 Limitations of the Study**

In a lesser magnitude the study encountered a challenge in the willingness of the firms' representatives to divulge important information requested through the questionnaires. This is attributed to the level of shrewdness and secretiveness in the logistics industry in Kenya. From a technical perspective, the study largely used interval type of likert scale to measure the variables. Whether a likert scale is usually treated more as an interval scale the scholars who treat it as ordinal argue that the intervals may not be equidistant with each other (Sekaran, 2006). This was a technical challenge of the use of likert-type summated method. This was however controlled through a hybrid questionnaire consisting of both likert scale and open-ended type questionnaire. Due to high homogeneity in terms of services offered by port-centric logistics services providers, the study anticipated this trait to be reflected in the data and in the analysis. Lean in services is a pretty new concept compared to the contemporary lean manufacturing which marks the onset of lean concept (Womack & Jones, 2005; Fullerton & Wempe, 2009).

This study explored lean practices in third party port-centric logistics firms in Kenya, which is a service sector and indeed an important service sector. The findings of this study are important in helping the firms to spur and influence great performance,

innovations and growth in this sector and beyond. Of particular interest is how the findings, lessons learnt and recommendations can be of great value to other service sectors like banking, retail, health care and others.

## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter critically reviews the theories and concepts in the area of lean management with a special focus to the lean practices. It reviews the existing literature on the lean practices and looks at the many studies touching on the concept in order to confirm what is done and the gap therein. Finally the review ends by a subjective judgement in regard to the quality of the literature explored.

#### **2.2 Theoretical Review**

In order to address the objectives of this study, four underpinning theories were identified that anchor and inform this research work. These theoretical models included: Contingency Theory, Resource Based View, Quality Service Theories, Institutional Theory and customer value theory. The aim is to address the study gap by establishing a theoretical foundation on which to synthesize information obtained through a systematic literature review of lean practices through the use of academic literature that eventually highlights and clarifies the potential effect of lean practices on operational performance of third party port-centric logistics firms.

##### **2.2.1 Contingency Theory**

The initial notion of contingency theory first appeared in the strategic management literature, and indicated that organizations are not closed systems, but are permanently exposed to contingency factors that should be considered at the time of choosing their strategies (Kim & Lim, 1988). Contingency theory is a major theoretical lens that considers this view, that there is no “one-size-fits-all” way to organize a company’s strategy which naturally poses a threat to the one-way approach to organize a company. It is improving to note that the choice of strategy should at the very least help an organization to improve performance and productivity (Hofer, 1975).

The typical frameworks in the contingency research tradition would consider the relationship between the environment, the strategy employed, and the performance component. In other words, the contingency argument suggests that the environment

that an organization operates within shapes its structure, and therefore, in order to maximize performance, organizations should match their structures and processes to the environment (Flynn, Huo & Zhao, 2010). Environmental dynamism can arise from many sources, including the rate of change of innovation in the company's principal industries, the introduction of new products and services, and the uncertainty or unpredictability of competitors' actions and customers' preferences (Miller & Friesen, 1983).

Third party port-centric logistics operates in an 'environment' just like other organizations do. There is no fixed way to organize a firm for superior performance. In this study, lean variables were considered as ingredients that feed into the lean strategy and the operating environment which is highly regulated. How these firms dealt with the environment affected strategy implementation hence immensely affecting the operational performance of the firms. Third party port-centric logistics firms in Kenya had to match their structures and strategies to the environment in order to optimize the operational performance.

### **2.2.2 Customer Value Theory**

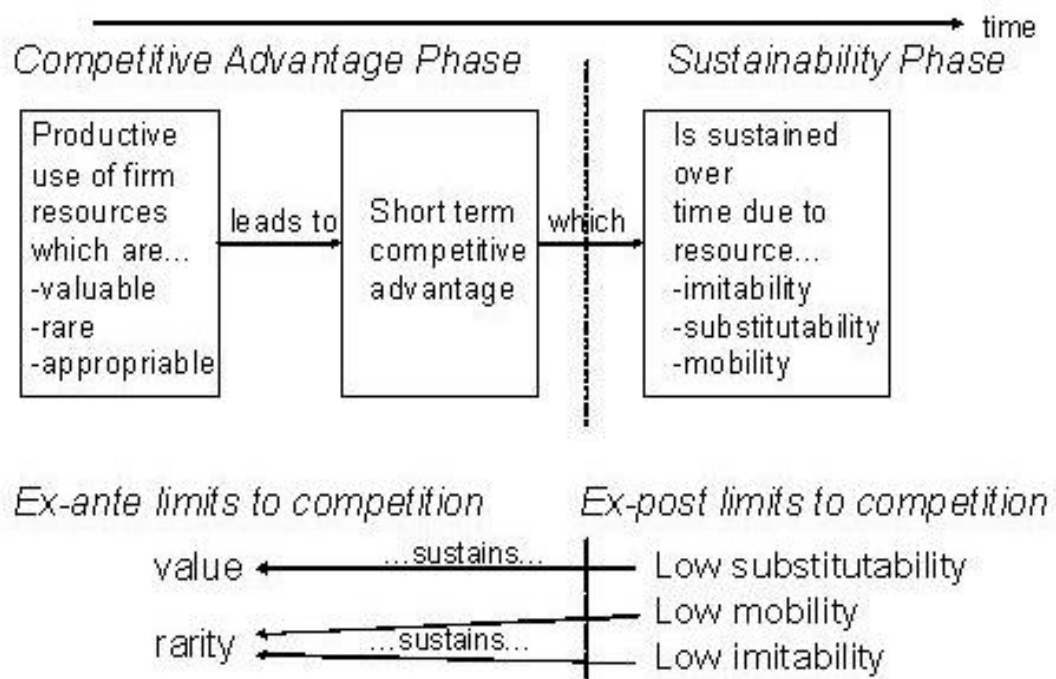
Customer value theory of the firm introduced by Slater (1997) states that firms exist to satisfy customers through superior value creation. This argument is consistent with the broader concept of leveraging strategic supply chain management or "best value supply chains" to create competitive advantages and enhance firm performance (Ketchen et al., 2008), and with depictions of leading-edge logistics service providers as being centrally focused on the needs of customers and highly equipped to fulfill customer needs (Beverland & Lindgreen, 2006). Customer orientation is a key component of market orientation that relates to having sufficient understanding of one's target buyers to be able to create superior value for them continuously and that customer-oriented firms are able to deliver value than the competitors and believe that their business exists primarily to serve customers and that the customer's interest should always come first (Deshpande et al. 1993)

Customer value theory is consistent with the broader concept of leveraging strategic supply chain management (inbound and outbound logistics are a part of supply chain)

or “best value supply chains” to create competitive advantages and enhance firm performance (Ketchen et al., 2008), and with depictions of leading-edge logistics service providers as being centrally focused on the needs of customers and highly equipped to fulfill customer needs (Beverland & Lindgreen, 2006). This theory was critical in this study since it helped in explaining the customer orientation and the firms’ value creation in order to achieve operational performance.

### 2.2.3 Resource Based View

Resource Based View (RBV) argument states that superior firm performance is the ability of firms to accumulate resources and capabilities that are rare, valuable and difficult to imitate (Barney, 2000). This theory focuses on a firm as the unit of analysis. A subset of these resources enables the firms to achieve competitive advantage. Several scholars have argued that viewing an organization from resource perspective overlooks the importance of resources that are embedded in a network of an organization (Dyer & Singh, 1998).



**Figure 2.1 The Resource-based View (Wade & Hulland, 2004)**

The purpose of practicing lean is to adopt quality management, eliminate waste in all areas of organizational operations, adopt low cost operations and embrace customer

care and roll out customer satisfaction programmes. The main aim of all this is to create a firm that is both competitive and responsive to the customers. Firms do not just succeed because they have adopted lean but rather because they use lean as a strategy to leverage their competitive offering of unique products and services. Third party port-centric logistics firms must uniquely use their scarce resources to create services that are unique by engineering quality, dealing with cost, reducing waste of resources and maintaining a customer focus in their production goals in order to achieve superior operational performance. To this end therefore, Resource Based View was an important theory in anchoring this study.

#### **2.2.4 Institutional Theory**

Institutional theory emphasizes the role of social and cultural pressures subjected on organizations that influence organizational practices (Scott, 1992). This theory attends to the deeper and more resilient aspects of social structure considering the processes by which structures, including schemas, rules, norms, and routines, become established as authoritative guidelines for social behavior (Scott, 2004). It inquires into how these elements are created, diffused, adopted, and adapted over space and time; and how they fall into decline and disuse.

Managerial decisions are strongly influenced by three institutional mechanism, namely; coercive, mimetic and normative isomorphism. These mechanisms create and diffuse a common set of values, norms and rules to produce similar practices and structures across organizations that share a common organizational field (DiMaggio & Powel, 1988; Powell & DiMaggio, 1991). Institutions are social structures that have attained a high degree of resilience. They are composed of cultural-cognitive, normative, and regulative elements that, together with associated activities and resources, provide stability and meaning to social life (Scott, 2001). The authors of this theory, affirms that an organization field is defined as those organizations that constitute a recognized area of institutional such as key suppliers, resource and product consumers, regulatory agencies and other organizations that produce services or products.

Jennings and Zandbergen (1995) observed that the coercive forces in the form of regulation are always amongst the main impetus, for instance, it is critical in the environment management practices in many organizations. Practicing lean may be quite a demanding and a dramatic adventure requiring a positive organization culture, transformative leadership and continuous and incremental implementation of customer focus, quality, cost management and waste reduction programmes within a highly regulated and competitive environment. This indicated that the institutional theory had a clear cut contribution in this study on the moderating effect on the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya.

### **2.3 Conceptual Framework**

A conceptual framework largely comprises of independent variables and dependent variables and systematically places descriptive categories in a broad structure of explicit propositions, statements of relationships between two or more empirical properties (which may be moderated or intervened) to be accepted or rejected (Kothari, 2012). A study by Rahman, Laosirihongthong and Sohal (2010) on the impact of lean strategy on operational performance used 13 lean practices from 187 middle and senior managers belonging to 187 Thai manufacturing firms.

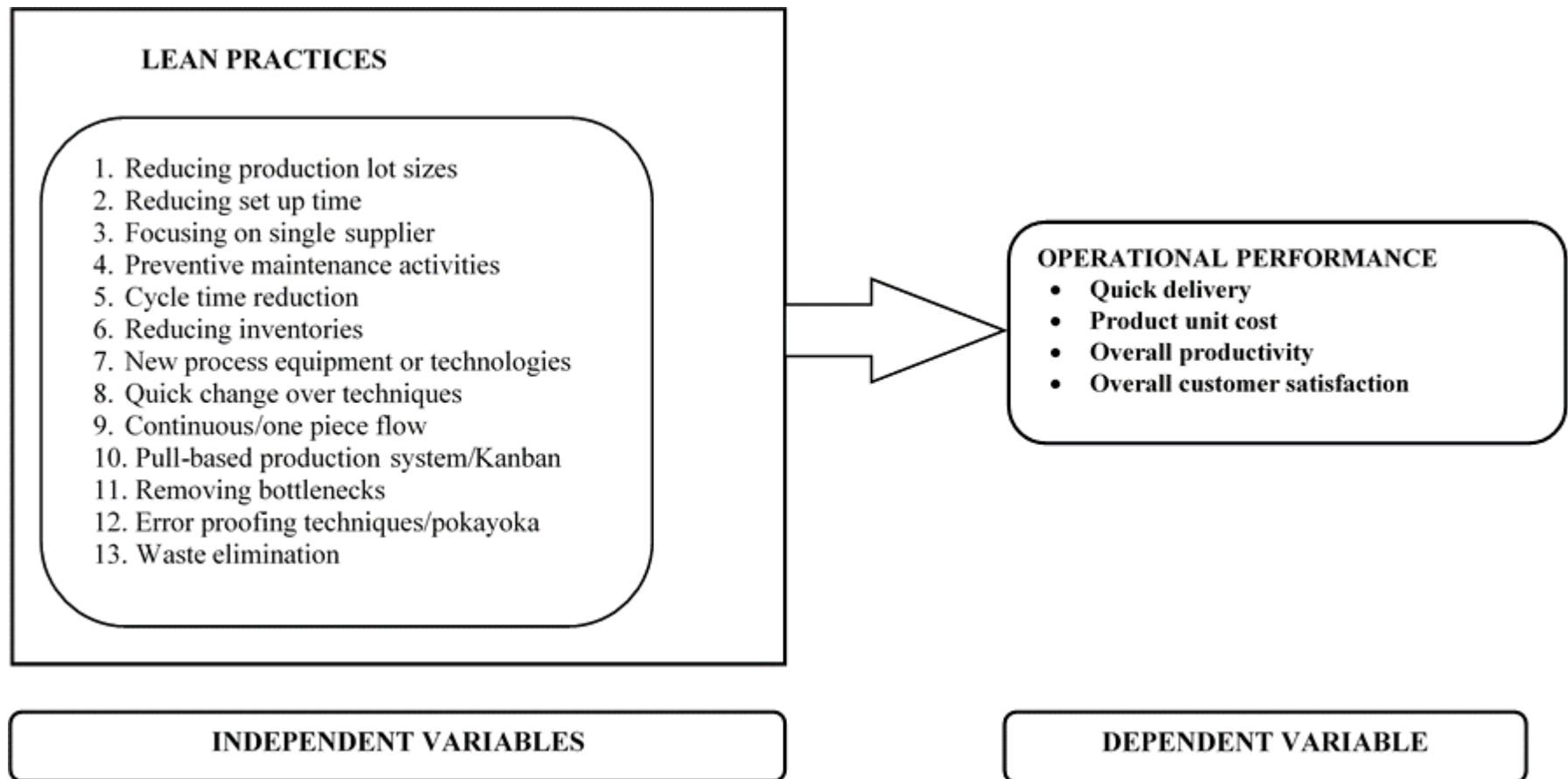


Figure 2.2 Conceptual Model of by Rahman, Laosirihongthong and Sohal (2010)



This study borrowed Rahman, Laosirihongthong and Sohal (2010) conceptual model by focusing for the variables to lean in services and introducing a moderating variable, that is, regulation. The conceptual framework used in this study is as presented in figure 2.3. It details both the independent variables (lean practices) and the moderating variable (Regulation) and how they link to the dependent variable (operational performance).

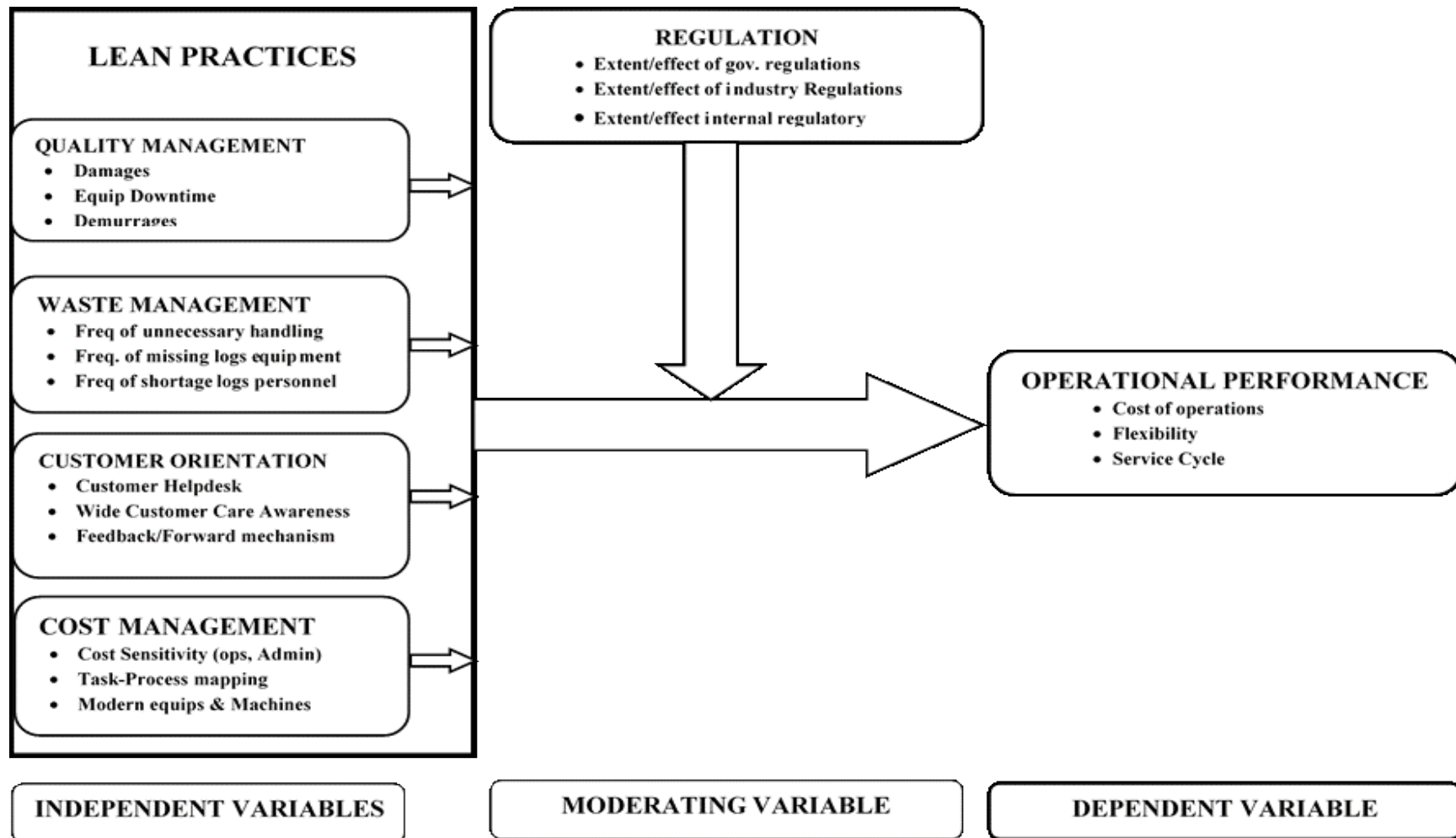


Figure 2.3 Conceptual Framework of the Study

### **2.3.1 Quality Management**

Quality is acknowledged as being critical to the value-adding process of product creation and delivery and in fact orders requiring rework have been estimated to cost in excess of eight times the cost of properly produced and delivered customer requirement (Bowersox et al., 1985). Quality management involves being proactive in performing the right activity the right way the first time, and continuing to perform tasks to the required level. Several research studies have shown that a lean strategy produces higher levels of quality and productivity and better customer responsiveness (Krafcik, 1998).

A number of studies on quality management including studies by Rahman (2006) on quality management in logistics by examining industry practices. Gunasekaran, Patel and Mcgaughey (2003) on a framework for supply chain performance measurement and Thai (2008) on quality in logistics: a comparison of practices between Australian and North American/European firms clearly show there is a great deal of support for the assertion that quality management as a lean practice played a role in influencing operational performance of third party port-centric logistics firms. This study therefore hypothesizes that there is no significant difference in the relationship between quality management and operational performance of third party port-centric logistics firms in Kenya ( $H_{01}$ ).

### **2.3.2 Waste Management**

In the original work by Toyota's Chief Engineer, Taiichi Ohno (Ohno, 1988) as part of the Toyota Production System (TPS), one of the key steps in Lean and TPS is the identification of which steps add value and which do not. Tapping, (2006) asserts that the prime purpose of a lean strategy is to eliminate waste (muda). This is a Japanese word meaning, futility; uselessness; idleness; superfluity; waste; wastage or wastefulness (Emiliani, Stec, Grasso & Stodder, 2007). Muda was one of the three types of wastes, namely; Muda, Mura and Muri and Waste reduction is an effective way to increase profitability and Toyota merely picked up these three words [Kenkyusha's New Japanese-English (KNJE), 2003].

The attitudes and tools of the TPS heighten awareness and gave whole new perspectives on identifying waste and therefore the unexploited opportunities associated with reducing waste (Emiliani et al., 2007). Resources which are commonly wasted are identified by pointing at seven wastes that must be eliminated. These wastes encompass the following: Transportation; Motion; Waiting; Over-processing and Defects. Whenever defects occur, extra costs are incurred reworking the part and rescheduling production. (Yang, Hong & Modi, 2011; Ohno, 1988). This study hypothesized that there is no significant difference in the relationship between waste management and operational performance of third party port-centric logistics firms in Kenya (H<sub>02</sub>).

### **2.3.3 Customer Orientation**

The development of market orientation is accepted as one of the major issues for organizations (Harris, 2002). Market orientation, from a behavioral perspective, can be described as the organization-wide generation of market intelligence pertaining to current and future customer needs, dissemination of the intelligence across departments, and organization-wide responsiveness. From a cultural perspective it is an essential element of business culture that most effectively and efficiently creates the necessary behaviors for the creation of superior value for customers (Narver & Slater, 1990). This study hypothesized that there is no significant difference in the relationship between customer orientation and operational performance of third party port-centric logistics firms in Kenya (H<sub>03</sub>).

### **2.3.4 Cost Management**

Cost management focuses on the ability to effectively manage production cost, including its related aspects such as overhead and inventory and value-addition. When a firm's operations department chooses lowering cost as its competitive priority, it must strive to produce at lowest cost and offer products at the lowest market price (Huo, Selen, Yeung & Zhao, 2008). Many manufacturers do not solely or even primarily compete on the basis of cost as a competitive priority, although cost is such an important competitive device (Browning & Heath (2009). Actually, the application of traditional or classical

management approaches (financial measures of cost of service/production, rigid bureaucratic structures and tight worker control) have been increasingly challenged and shown to be ineffective with new business models emphasizing the importance of holistic, systems or process perspectives (Blanchard, 2007).

In cost leadership, a firm sets out to become the low cost producer in its industry for a given level of quality. In this arrangement, the firm sells its products either at average industry prices to earn a profit higher than that of rivals, or below the average industry prices to gain market share (Thompson, Strickland & Gamble, 2010). In the event of a price war, the firm can maintain some profitability while the competitor suffers losses. If a firm can achieve and sustain overall cost leadership, then it will be an above average performer in its industry, provided it can command prices at or near the industry average (Huo et al., 2008).

Most notable was the rise of the lean enterprise as an organisational formation that represented a step-change in operational design from previous scientific approaches. This approach focuses on bottom-up, worker-led improvements and a process wide approach to production that has drastically reduced costs and improved quality across a range of industries and an observation done that lean transformation has made inroads into a range of manufacturing arrangement and that the concept is still being developed and its application the service sector still at the up-scale stages (Piercy & Rich, 2009). This study hypothesized that there is no significant difference in the relationship between waste management and operational performance of third party port-centric logistics firms in Kenya (H<sub>04</sub>).

### **2.3.5 Regulation**

Regulation of business activity is a key issue confronting national governments and supranational policymakers [Organisation for Economic Co-operation and Development (OECD), 2000]. It is a diverse set of instruments by which governments set requirements on enterprises and citizens and comprises a set of ‘incentives’ established either by the

legislature, Government, or public administration that mandates or prohibits actions of citizens and enterprises.

Most of the times, regulations are supported by the explicit threat of punishment for non-compliance [Organisation for Economic Co-operation and Development (OECD), 2000; 1994]. They are government measures or interventions that seek to change the behaviour of individuals or groups [Better Regulation Task Force (BRTF), 2003]. This study therefore hypothesizes that there is no significant difference in the moderated relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya ( $H_{05}$ ).

### **2.3.6 Operational Performance**

Performance is the nature and quality of an organization's behaviors to complete their main tasks and functions and to generate profit and there are two core dimensions of business performance: operational and financial performances (Chavez et al, 2013; Chase et al., 2010). Operational performance relates to a company's performance in serving customers in terms of quality, flexibility, on time delivery (Wang et al., 2010; Chase et al., 2010). Operational performance can be further classified into cost and service performances where service performance is also commonly used in measuring operational service performance in terms of the quality of the service, on-time delivery, and flexibility of the service (Daugherty et al., 2009).

## **2.4 Empirical Review**

It is clear that lean revolution is underway, particularly within the US manufacturing companies, although the jury is still out on what exactly the end result of what a pure lean initiative ought to be (Nawanir, Teong & Othman, 2013; Blanchard, 2007). Lean is not beyond reproach and its definition, use, and impacts remain much debated (Pettersen, 2009). Despite its current popularity, lean is often said to fail in implementation (Bhasin, 2008) and it is something that lean has in common with other management systems and

organisational changes where studies report failure rates of up to 70 percent (Blanchard, 2007).

With regards to lean, evidence indicates that failure may be rooted in limited implementation experience, a tendency to return to old routines, low management commitment, lack of training and education, poor linkage between lean activities and overall strategy (So & Sun 2010; Radnor et al., 2006). This section therefore reviews the empirical studies on the individual lean practices explored in this study. The section unfolds the literature on the empirical relationship studies between; quality management, waste management, customer orientation cost management with operational performance as well as the overall relationship between lean practices and operational performance.

#### **2.4.1 Quality Management**

In a study on cross-cultural influences on quality management systems (Low, 2010) describes quality as the predictable degree of uniformity and reliability at a cost that will deliver a price that the customer is willing to pay for or suited to the market niche the firm is operating in. In logistics, service quality translates into strategies aiming at making order cycle times shorter and more predictable, as well as maintaining certain levels of in-stock availability and certain fill rates on customer orders (Choi & Rungtusanatham, 1999).

Wambugu (2010) conducted a study on total quality management and operational performance of central glass industries Limited and indicate that customer focus, top management support and strategic quality planning were the critical lean practices adopted by the firm. The study affirmed a strong positive link between customer focus, employee involvement and process approach to operational performance. The study recommended the adoption of all the TQM practices in a holistic manner in order to rip the benefits of total quality management of high operational performance. These findings synchs well with the findings of the study (Fong, 2008) that described quality management as the basis for competitive advantage and that, firms that implement quality systems enhance their

relationship with suppliers and customers resulting in improved performance in all aspects.

Wiengarten, Fynes and Onofrei (2013) conducted a study on exploring synergetic effects between investments in environmental and lean quality practices in supply chains and generally found out that there was a synergetic effects between traditional practices such as lean and quality and environmental practices. Specifically the study highlighted that lean and quality practices on operational supply chain performance is affected by environmental practices such as ISO 14001, pollution prevention, recycling of materials and waste reduction.

A study by Thai (2008) on service quality in maritime transport: conceptual model and empirical evidence revealed that service quality in maritime transport logistics is a six-dimensional construct consisting of resources, outcomes, process, management, image, and social responsibility (ROPMIS). The study also found out that the factors involving the outcomes and process of service provision and management factors all focused on satisfying the customers. The findings also emphasised process and management-related factors, with human element, which involves the center of all service quality systems.

A study by Oyiro (2017) on total quality management and operational performance of construction companies in Nairobi found out that quality management practices was positively associated with operational performance. The study recommended that firms should adopt customer focus culture and continuous improvement in their operations. This eventually delivers immeasurable benefits including high productivity, lower cost and improved delivery time culminating into improved operational performance.

In a study conducted by Rahman (2006) on quality management in logistics by examining industry practices, observed that managers described quality in logistics, from a total of nine different components. Respondents ranked “on-time delivery” (82.7 per cent), “total support of customer needs” (53.8 per cent), and “consistency of order cycle” (40.4 per cent) as the most important. On-time delivery, and order cycle are frequently cited in



literature as critical measures of logistics performance. These non-cost measures are used in practices along with cost measures within the scorecard and supply chain operations reference (SCOR) performance models (Rahman, 2006; Gunasekaran, Patel & Mcgaughey, 2003).

Jinhui, Zhang and Schroeder (2010) conducted an expansive study on customization of quality practices: the impact of quality culture amongst 238 manufacturing plants located in eight countries and three industries. The study found out that quality exploitation practices were highly related to performance outcomes particularly when quality culture was not the prevailing organization culture. In contrast, quality exploration practices were statistically-significantly associated with operational performance with dominant quality culture playing a critical role in organizational culture.

#### **2.4.2 Waste Management**

This lean operations management design approach by TPS focused on the elimination of waste and excess from the tactical product flows at Toyota (the Toyota “seven wastes”) and represented an alternative model to that of capital-intense mass production (with its large batch sizes, dedicated assets and “hidden wastes”) (Yang, Hong & Modi, 2011; Ohno, 1988). Just in Time (JIT) philosophy is perhaps the most fundamental element of the TPS which was developed in the framework of TPS to curb production waste of any form. It evolved exactly out of the need of the Japanese industry to survive in the post-war global market. Soon, the value of the system was proven to the global manufacturing industry and a great number of companies worldwide hastened to implement this model of production to their own production systems (Sanchez & Perez, 2011).

The recognition of Lean management as an improved version or better descendant of the TPS and the JIT philosophy, but certainly not as their substitute or replacement (Strozniak, 2001) is also apparent in a number of reports that have been published in the context of the IMVP or a similar project known as the Lean Aircraft Initiative (LAI) [Massachusetts Institute of Technology (MIT), 2000]. LAI was initiated as a collaborative effort between

the MIT, the US Air Force and other aerospace defense industries to extent Lean Principles and practices to high variety-low volume industries. It is important to emphasize that the prime purpose of a lean strategy is to eliminate wastes (muda) (Tapping, 2006) and several research studies have shown that a lean strategy produces higher levels of quality and productivity and better customer responsiveness (Dora et al., 2014; Nawanir, Teong & Othman, 2013; Anand & Kodali, 2009)

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The prime purpose of a lean strategy is to eliminate wastes (muda) (Yang, Hong & Modi, 2011) and several research studies have shown that a lean strategy produces higher levels of quality and productivity and better customer responsiveness (Krafcik, 1998). The impact on lean strategy is mostly based on empirical evidence that it improves the company's competitiveness (Doolen & Hacker, 2005). It is worth mentioning that the impact of lean thinking as a strategy is important not only in manufacturing but also for the entire supply chain. Studies show that a lean strategy produces higher levels of quality and productivity and better customer responsiveness and the impact of lean as a strategy is mostly based on empirical evidence that it improves the company's competitiveness (Doolen & Hacker, 2005).

Rahman, Laosirihongthong and Sohal (2010) on the impact of lean strategy on operational performance: a study of Thai manufacturing companies using 13 lean practices and positing that all the lean constructs used in the study were significantly related to operational performance. JIT had a higher level of significance in large firms compared

to SMEs, whereas for waste minimization there was a higher level of significance for SMEs compared to large firms. The study also indicated that foreign-owned manufacturing firms had a higher level of significance on operational performance for both waste management and flow management than Thai and joint venture.

A study by Hwang, Hwang and Hong (2014) on lean practices for quality results: a case illustration revealed that effective implementation of lean practices increased bottom-line results and improved organisational integrity requiring sharing of goals and processes among healthcare managers and professionals. Although many examples suggest that lean practices are beneficial from a productivity standpoint, in a dynamic healthcare systems, lean practices has received mixed responses. The study however concluded that practicing lean indeed minimised waste and unnecessary hospital stays by patients while simultaneously enhancing customer values and appropriately deploying resources.

### **2.4.3 Customer Orientation**

Third party logistics services (3PL) is the management, control and delivery of logistics activities on behalf of a shipper by an external provider (Lynch, 2005). Previous research supports 3PL relationships between a firm's market-orientation and its own performance and between logistics service and firm performance (Stank, Goldsby, Vickery & Savitskie, 2003). However, the explicit market-oriented behavioral practices that influence firm performance outcomes are still not well-understood. To better understand how market-oriented beliefs are leveraged to enhance service-related firm performance we draw upon customer value theory earlier discussed.

Market-oriented firms' constant refinement of their market-sensing and customer-relating capabilities in order to respond through the development of new customer value-focused capabilities as well as the addition of valuable products and services (Olson, Slater & Hult 2005). Customer firms' logistics performance improves does not just improve because 3PLs espouse a customer orientation but rather, because they effectively create value by

enhancing customer firm logistics performance when complementary explicit behaviors that reinforce customer orientation are implemented.

In the case of customer-oriented 3PL service providers, this involves leveraging key elements of logistics service operations to favorably impact customer firm performance (Yu Tian, Ellinger & Chen, 2010). Among many success determinants in existing field of research, market orientation has often been shown to have strong link with the success of firms' innovative efforts (Mavondo & Farrell, 2003). Positive outcomes have been found for organizations who understand the latent needs of customers – needs of which ordinary customers are unaware, or have difficulty articulating (Olson et al., 2005). Studies support relationships between a firm's market-orientation and its own performance (Hult & Ketchen, 2001) and between logistics service and firm performance (Stank et al., 2003).

#### **2.4.4 Cost Management**

Oyerogba, Olaleye, and Solomon (2014) conducted a study cost management practices and firm's performance of manufacturing organizations by 40 manufacturing companies listed at the Nigeria Stock Exchange during the period of 2003 to 2012. The study found out that there was a significant positive relationship between cost management practices and firm's performance in the manufacturing organizations considered. The study therefore recommended that a cost reduction strategy with emphasis on production overhead cost and administrative overhead cost be embarked upon in order to continuously improve performance.

The survival duplex for any company in modern times is how to manage product/service cost and quality which is the surest way of superior performance. It is highly recommended today that cost management in any firm be an ongoing and continuous improvement activity within the company so as to enhance profitability and survival (Innes, John, Mitchell & Sinclair, 2000). Customers today are continuously demanding high quality and better performance products/services and at the same time, they want the price to be reasonably low. The shareholders are also demanding a required rate of return

on their investment from the company. Thus cost has become a residual. The challenge is being able to manufacture products or provide services within the acceptable cost framework Oyerogba, Olaleye, & Solomon (2014).

Blanchard (2007) in a study on lean green and low cost posits that just because lean is popular does not necessarily mean it is working according to plan. Indeed most companies believe that lean's main benefits come from cutting costs, although that is a mistaken perception, because lean management is not a quick fix solution for cost reduction. In this study Blanchard states that lean is a fundamentally different system than traditional management for organizing and managing employees, suppliers, customer relationships, product development, production and the overall enterprise.

A study by McIvor (2001) on lean supply on the design and cost reduction dimensions indicated that presence of presence of some of the principles associated with lean supply in areas such as higher levels of customer and supplier integration in the new product development process and high levels of information exchange in the supply chain. However, McIvor posits that total leanness along these dimensions was absent meaning that the firms did not go full swing to embrace and implement lean in their supply chains. The study also revealed existence of barriers in the effort to meet lean supply chain benefits amongst partners and that majority of benefits accrued from the relationship were obtained by the customer.

A study on lean supply chain and its effect on product cost and quality: a case study on Ford Motor Company found out that values stream mapping supported lean supply chain and identifies potential opportunities for continuous improvement to eliminate waste with ultimate cost reduction. The study also found out that culture change was a long term philosophy which was highlighted as the foundation for Toyota and other companies to sustain success and continuous growth of its fundamentals (Wee & Simon, 2009).

A study on understanding performance drivers of third-party logistics providers in mainland China: A replicated and comparative study found out that cost or differentiation strategy caused improved financial performance of 3PL providers in China. The study concluded that as much as emphasis of low cost remains crucial, it may result in worse financial performance. In mainland China, low- cost emphasis was affected by local competition, but not by operational challenges while in Hong-Kong it was influenced by both local competition and operational challenges. Overall, operational challenges had a positive impact on low-cost emphasis in Hong Kong, but no impact in mainland China. On the underdeveloped third-party logistics providers industries, the study revealed that those firms maintained a reasonable service performance (Wang et al, 2010).

#### **2.4.5 Regulation**

In the United States of America, the number of federal regulation continues to grow, increasing from 71224 pages of regulation in 1975 to 178277 pages of regulation by end of 2016 and the budget for implementing federal regulation moving more than a hundred fold since then (Law Librarians' Society of Washington, 2016). Considerable interest has been generated regarding regulation and the regulatory environment for businesses particularly Small and Medium Enterprises (most 3PL are part of SMEs), development. [Small Business Project (SBP), 2004] recommends an appropriate regulatory environment as the single most important element in an economic growth strategy which is essential for robust private sector development. It is important to note that economies with better regulation grow faster and therefore the fruits of improved regulation cannot be overemphasized (Djankov, McLiesh & Ramalho, 2006).

The World Bank report show that countries that regulated improved from the worst quartile of business regulation to the best registering a 2.3 percentage point increase in annual economic growth. Therefore by setting the “rules of the game”, public institutions impact on economic development (World Bank, 2002). Market regulation may not result in welfare improvement because information asymmetries can contribute to imperfect regulation. The regulator and the regulated can be expected to have different levels of

information about such matters as costs, revenues and demand (Djankov, La Porta, Lopez-de-Silanes & Shleifer, 2002). The regulator may not be able to coax the regulated to provide all the information to regulate optimally to maximize social welfare, the results of regulation, in terms of outputs and prices remain “second best” to those of a competitive market (Djankov et al., 2002; Djankov, McLiesh & Ramalho, 2006).

The impact of government regulation on businesses is an important policy concern for economies worldwide (European Commission, 2010). It is generally believed that regulation is necessary to provide stable trading conditions and to develop levels of business trust which can benefit SME development (Atherton et al., 2008). However, experts believe that the nature of the regulatory burden may affect businesses competitiveness and productivity. Opponents of regulation argue that it restricts business start-up, impedes successful performance and growth, and contributes to business failure.

The “problem” of regulation for business owners involves the diversion of scarce resources away from what are argued to be productive, profit-generating activities and towards the discovery, understanding of, and compliance with regulation. Some argue that although individual regulation may not constitute much of a problem, their cumulative effect is highly problematic for small firm owners (Harris, 2002). Actually it is true that big businesses suffer from strong regulation although not the same degree as the small and medium enterprises (Akinboade & Kinpack, 2012).

It is generally agreeable by many parties regulation is necessary to provide stable trading conditions and to develop levels of business trust which can benefit business development (Atherton et al., 2008). However, experts believe that not all regulation are the same; the nature of the regulation burden may affect enterprise competitiveness and productivity (Akinboade & Kinpack, 2012). The literature discussed in this section affirms that regulation indeed influences operational performance whether directly or indirectly, be it private or public firms irrespective of whether it is in service or manufacturing industries.

#### **2.4.6 Lean and Operational Performance**

A study by Dora et al. (2014) on application of lean practices in small and medium-sized food enterprises observed that lean manufacturing practices in food processing SMEs was generally low and still evolving and that some lean manufacturing practices were more prevalent than others. Further the study highlighted the challenges encountered by SMEs in practicing lean as emanating from the intrinsic features of the sector the firms operated in and such as high perishability of products, complicated processing, extremely variable raw materials and unpredictable demand.

By using stratified random sampling, Nawanir, Teong and Othman (2013) conducted a survey-based cross-sectional study on the impact of lean practices on operations performance and business performance: Some evidence from Indonesian manufacturing companies. The study was designed around a set of four hypotheses with results providing evidence that lean practices should be implemented holistically. The study further found out that lean practices had a positive and significant impact on both operational performance and business performance and that operational performance partially mediated the relationship between lean practices and business performance.

Anand and Kodali (2009) presented a case study of a medium-sized valve manufacturing company demonstrated that the implementation of a lean manufacturing system resulted in superior organizational performance compared to other practices namely flexible manufacturing systems and computer-integrated manufacturing systems. Browning and Heath (2009) conducted a case study on Lockheed Martin's production system for the F-22 program. The study found out how novelty, complexity, instability and buffering affect the relationship between lean implementation and production costs and the found out a positive linkage.

Wiengarten, Fynes and Onofrei (2013) conducted a study on exploring synergetic effects between investments in environmental and lean quality practices in supply chains and generally found out that there was a synergetic effects between traditional practices such



as lean and quality and environmental practices are possible. Specifically the study highlighted that lean and quality practices on operational supply chain performance is affected by environmental practices such as ISO 14001, pollution prevention, recycling of materials and waste reduction.

Lean is not a new concept in the local perspective and many studies have broadly been conducted on lean aspects in both manufacturing and services. Kisombe (2011) conducted a study amongst companies in the sugar sector in Kenya on lean manufacturing tools and the results revealed that attention had not been given to all the key areas of lean manufacturing from a holistic perspective; instead, only a piecemeal approach had been taken. The study concluded there lacked understanding of lean manufacturing concepts and therefore the firms had not reaped full benefits of lean implementation. Most manufacturing companies listed in Nairobi Securities Exchange, have embraced lean supply chain management by use of cross-enterprise collaboration, lean supply chain technologies, Kaizen, workplace and system organization, lean warehousing, Kanban and demand management (Shedrack, 2013).

Macharia (2009) in a study on lean procurement and supply chain performance at Safaricom Limited posits that the firm adopted lean procurement practices resulting in improved performance. Less process waste, reduced inventory, reduced lead time, less rework, financial savings and increased process understanding as the benefits emanating from the implementation of lean manufacturing practices (Openda, 2013). A study by Kanjejo (2012) on lean supply chain management practices at public universities in Kenya established that although lean concept was being adopted, rigid organizational culture and resistance to change among public universities was a major obstacle to successful implementation of lean supply chain management practices.

In a study on barriers to lean implementation in the construction industry in China, Shang and Pheng (2014) found that most barriers to implementation of lean practices were lack of a long-term lean philosophy and the absence of a lean culture in those organisations. The study also identified the six underlying factors hindering the implementation of lean

practices in the Chinese construction industry, namely, people and partner issues, managerial and organizational issues, lack of support issues, culture and philosophy issues, government issues and procurement issues.

## **2.5 Critique of Existing Literature**

Majority the area of lean management and performance or indeed operational performance focuses on limited aspects of lean (Cagliano, Caniata & Spina, 2004). Many of these studies discuss lean and performance and tend to be case based on individual organizational experiences. For example, Dhandapani, Potter and Naim (2004) described a case study of a steel plant in India which realized a substantial production and inventory cost reduction by the implementation of lean practices. Abdulmalek and Rajgopal (2007) conducted a study in large integrated steel mill where lean principles were adapted in conjunction with value stream mapping tool and simulation models.

There are many empirical literature (Wiengarten, Fynes & Onofrei, 2013; Wambugu, 2010; Oyiro, 2017; Rahman, 2006) on the relationship between quality management and operational performance that indicate a positive relationship between the two variables. At the the same time, literature exists that indicate otherwise casting some doubt on whether every firm that has implemented quality systems always enjoy improved operational performance (Thai, 2008; Jinhui, Zhang and Schroeder, 2010; Wambugu, 2010).

On waste management, a number of studies already explored indicate a general congruence that firms that have adopted waste management practice have better operational performance outcomes (Dora et al., 2014; Nawanir, Teong & Othman, 2013; Yang, Hong & Modi, 2011; Sanchez & Perez, 2011; Rahman, Laosirihongthong & Sohal, 2010). A few studies though indicate that the lean is not a full proof of performance improvement. For instance, Doolen and Hacker (2005) argues that the impact of lean as a strategy is largely based on empirical evidence that it improves the firms' performance. This implies that a case by case, whether in the industry or individual firms must

investigated. Hwang, Hwang and Hong (2014) agrees that many examples suggest that lean practices are beneficial from a productivity standpoint, but in a dynamic healthcare systems, lean practices have received mixed responses.

Existing literature supports relationships between a firm's positive market-orientation and its own performance and between logistics service and firm performance (Yu Tian, Ellinger & Chen, 2010; Stank et al., 2003; Mavondo & Farrell, 2003) but there are studies that indicate that explicit market-oriented behavioral practices that influence firm performance outcomes are still not well-understood (Meyer & Schwager, 2007; Flint, Larsson Gammelgaard & Mentzer, 2005).

When a firm's operations department chooses lowering cost through efficient low cost operations as a competitive priority, it must strive to produce at lowest cost and offer products at the lowest market price (Huo et al., 2008). There are a number of studies that show firms enroute this direction end up with higher productivity (Oyerogba, Olaleye & Solomon, 2014; Wee & Simon, 2009; Piercy & Rich, 2009; Blanchard, 2007). However this is not always the case, for instance a study on lean supply on the design and cost reduction dimensions indicated of existence of barriers in the effort to meet lean benefits such as lower prices amongst partners (Wang et al, 2010; Blanchard, 2007; McIvor, 2001).

On the general relationship between lean practices and operational performance, many studies affirm a strong significant association between these variables (Wiengarten, Fynes and Onofrei, 2013; Nawanir, Teong and Othman, 2013; Anand and Kodali, 2009; Openda, 2013; Kanjejo, 2012). However, studies such as Dora et al. (2014), Chavez et al. (2013), Shang and Pheng (2014) and Browning and Heath (2009) revealed barriers and challenges regard to lean practices influencing performance. For instance, Kisombe (2011) conducted a study amongst companies in the sugar sector in Kenya on lean manufacturing and performance and revealed that attention had not been given to all the key areas and instead, only a piecemeal approach had been taken in lean adoption and therefore firms did not reap full benefits lean professes.

## **2.6 Research Gap**

An effective logistics operation can provide a competitive advantage for a firm and increase a firm's market share (Mentzer, Flint & Hult, 2001). Much of this value is generated from the ability to reduce costs and provide delivery solutions according to customer needs. Various studies concentrate on lean practical components namely, lean tools (Campbell, 2006), the culture, the obstacles to lean, the implementation or viewing Lean in a narrow manufacturing context (Smalley, 2009; Hines, Martins & Beale, 2008). It is critical to point out that the growth power in many economies rests in service based sector which is true for the Kenyan economy. Lean is applicable in services through transfer of lean manufacturing principles to services although services have certain limitations because of their characteristics which creates a necessity to standardize lean service principles and tools and to develop guidelines for structured implementation in service industry (Gupta, Sharma & Sunder, 2016).

In implementing and practicing lean, service firms experience many problems and challenges such as too much focus on lean tool workshop and ignoring other important aspects such as customer focus and delivery (Radnor & Osborne, 2013). Another challenge in service sector has been firms adopting lean without regard to lean thinking and its development since its inception ending up with a cosmetic lean scenario (Asnan, Nordin & Othman, 2015). As well, lean in services unlike in manufacturing requires an organization wide employee involvement with a unifying theme around the customer as well as management commitment for a continuous improvement and superior organizational performance (Damrath, 2012).

Lean management story is told with nostalgia, with almost equal measure of success and failure. Often it fails to deliver the performance it promises to firms that are seeking to boost performance (Thai, 2008; Hwang, Hwang and Hong, 2014; Bhasin, 2008; Meyer & Schwager, 2007; Wee & Simon, 2009; Dora et al., 2014; Chavez et al., 2013). Post implementation, firms, sectors and industries need to keep abreast of what lean aspects are working and what aren't in order to take immediate interventions. Although lean

practices are known to influence operational performance of firms (Wiengarten, Fynes and Onofrei, 2013; Nawanir, Teong and Othman, 2013; Anand and Kodali, 2009; Openda, 2013; Kanjejo, 2012) from myriad backgrounds and industries, there was need to subject the same check in the unique context of third party port-centric logistics firms in Kenya.

## **2.7 Summary of Literature Review**

This chapter reviewed literature broadly touching on lean as a concept and the practices there of as introduced by the lean proponents. The chapter critically dealt with the literature guided by the five (5) variables, that is quality management, waste management, customer orientation management and cost management (independent variables), Regulation (moderating variable) and the operational performance (dependent variable). The relationship between these variable has been captured in the conceptual framework. Further the literature covered the theories that underpinned this investigation which include Contingency Theory, Customer Value Theory, Resource Based View (RBV) and the Institutional Theory.

Service sector has special significance to any given society whether small or large and services including government services, public interest services, healthcare services, banking, hospitality, amongst many others, have got a big market share. Since lean management is a proven approach for successful process improvements, it is important that logistics services be looked at purely from a services perspective by disengaging it from the bundle of the proponents whose view was purely from a manufacturing perspective. Through the eyes of the existing literature, it is clear that the study contributes immensely to the existing knowledge and in bridging the research gap that exist in the moderated relationship and as well in the conceptual and contextual perspectives.

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

This chapter starts by stating and describing the research design for the study and the justification thereof. The population of the study together with the sampling techniques also been discussed in this chapter. Research instruments and the study procedure are also captured and elucidated in this chapter. In conclusion, pilot study, data analysis and hypotheses testing statistics that were used in the analysis of the collected data have been discussed.

#### **3.2 Research Design**

The research design for this study was a survey design coupled with cross-sectional approach. Mugenda (2008) describes a survey research as an attempt to collect data from members of a population in order to determine the current of that population with respect to one or more variables. A survey research is a method of gathering primary data based on communication with a representative sample of individuals or subjects. It is a quantitative research that enables identification of characteristics of a particular group, to measure attitudes and to describe behavioral patterns (Zikmund, Babin, Carr & Griffin, 2012).

A survey as a measurement process was used to collect information during a high structured interviews, sometimes with a human interviewer and other times not. The goal of the survey was to derive comparable data across a chosen sample so that similarities and differences can be found. Because of their robustness, survey findings are projectable to large and diverse populations (Cooper & Schindler, 2011). Several research works (Rahman, Laosirihongthong & Sohal, 2010; Jinhui Wu, Zhang & Shroeder, 2010; Thai, 2008) in lean, quality, logistics or distribution management have utilized survey design in the previous studies.

In order to realize the objectives of this study, positivism research paradigm was used. This involved objective testing of empirical hypotheses that were formulated on the predictions of objected phenomena and which allowed operationalisation of the various variables and generalization of the results. The posit connection between theory and research carry with them the implication that made it possible to collect observations in a manner that was not influenced by pre-existing theories, without predisposing and negating objectivity (Williams, 2013).

### **3.3 Study Population**

Population refers to the universe of units which may be individuals or objects of focus of similar characteristics being sort after and from where a sample is drawn for the purposes of a study at hand (Kothari, 2012; Zikmund et al., 2012). The population of study was all 1064 registered third party port-centric logistics firms in Kenya (KRA, 2016). The sampling frame listing was obtained from Kenya Revenue Authority (KRA). KRA is the sole entity that authorizes and involved in licensing all third party port-centric logistics firms in Kenya. A sampling frame is a complete and exhaustive listing of all the objects or individual members or units of the population from which each sampling unit is selected to make up the study sample (Zikmund et al., 2012, Saunders, Lewis & Thornhill, 2009).

### **3.4 Sample Size and Sampling Technique**

The choice of a sample size is always largely determined by the confidence one needs to have in the data, the margin of error tolerable, the types of analysis going to be undertaken and the size of total population from which the sample will be drawn (Saunders, Lewis & Thornhill, 2009). Mugenda (2008) gives a guideline that, the bigger the population the smaller the percentage of population that should be used in the sample. By considering these two scholarly view point, this study used a representative sample size of 164 third party port-centric logistics firms representing about 15% of the population (1064 firms) using KRA (2016) sampling frame.

The study through the selected sample (164 firms) was conceptualized within four groups of lean issues that make up lean practices, that is, quality management, waste management, customer orientation and cost management. This representative sample (164 firms) was drawn from the population using stratified sampling where the sub sample from each strata was picked disproportionately to ensure that all groups are represented. Table 3.1 indicates sample size determination.

**Table 3.1 Sample Size Determination**

<b>Stratum (Location of 3PL Firms)</b>	<b>Pop. Proportion (3PL Firms)</b>	<b>3PL Firms in the Sample</b>	<b>% Stratum Proportion</b>
Nairobi (Capital)	566	84	14.8%
Mombasa (Seaport)	491	73	14.9%
Nakuru	2	2	100%
Eldoret	3	3	100%
Kisumu	2	2	100%
<b>Total</b>	<b>1064</b>	<b>164</b>	

In the actual execution of the study, most of these firms were found to have an operations or logistics office in the seaport city.

### **3.5 Research Instruments**

This study used a questionnaire as the data collection instrument. A questionnaire is a general term used to include all techniques of data collection in which each person is asked to respond to the same set of questions in a predetermined and one of the most widely used data collection technique within the survey strategy (Saunders, Lewis & Thornhill, 2009) and which provides the most efficient way of collecting responses from a large



sample prior to quantitative analysis. Robson (2002) states that a questionnaire works best with standardized questions that the researcher can be confident will be interpreted the same way by respondents.

Five-point likert technique was predominantly used for closed ended type of questions in this study. Likert scale was appropriate since it is a psychometric approach for measuring of attitudes, beliefs and opinions where each respondent indicates a degree of agreement or disagreement in a multiple choice type format (Likert, 1932). It is one of the best approaches in questionnaire design since it communicates interval properties to the respondents by producing data that is assumed to be related to an interval scale. The data collected from the Likert scale can be evaluated easily through standard quantitative techniques such as basic regression analysis, moderated multiple regression analysis and factor analysis (Montgomery, Peck & Vining, 2001).

In this study, Moderated Multiple Regression (MMR) analysis was used. Rahman, Laosirihongthong and Sohal (2010) in a survey study on impact of lean strategy on operational performance: a study of Thai manufacturing companies used a likert scale type of questionnaire to collect data. In order to balance the responses and gain an in depth understanding of various lean and performance issues from the respondents, the questionnaire incorporated open-ended questions sections to collect data in this study. This approach was very beneficial particularly because this study required a mixed approach in the data collection in order to effectively capture and balance out the feelings and attitudes of the respondents (Zikmund et al., 2012).

### **3.6 Data Collection Procedure**

The principle data collection administration approach used in this study was the self-administered questionnaire approach. The instrument was administered to each third party port centric logistics firms in the sample targeting a management staff in the logistics division of each of the firm. These questionnaires were distributed through hand delivery for a period of seven (7) to fourteen (14) days for the respondents to work on them. After

this period the questionnaires were collected. Some firms requested for more time owing to the technical nature of the questionnaire. Overall, data was collected for a period of about five weeks. In many survey studies such as Rahman, Laosirihongthong and Sohal (2010); Jinhui Wu, Zhang and Schroeder (2010) and Thai (2008), questionnaires were physically distributed and collected.

### **3.7 Pilot Testing**

Data collection phase typically begins with pilot testing. Before using a questionnaire to collect data, it should be pilot tested (Cooper & Schindler, 2011). The purpose of a pilot test is to refine the questionnaire so that respondents have no problems in answering the questionnaires and as well eliminate problems in recording. It enables researchers obtain some assessment of the questionnaires validity and the likely reliability of the data that is collected and preliminary analysis can be undertaken to ensure that the data collected enables investigative questions to be answered through the study (Saunders, Lewis & Thornhill, 2009).

Bell (2005) advises that 'however pressed for time the researcher is, do the best to give the questionnaire a trial run, as, without a trial run, you have no way of knowing your questionnaire will succeed. A study by Fink (2003) argues that for many student questionnaires, the minimum number for a pilot is 10 subjects although for large surveys between 100 and 200 pilot responses is usual (Dillman, 2000). Cooper and Schindler (2011) on the other hand posits that the size of pilot group may range from 25 subject to 100 subjects depending on the method to be tested, but the respondents do not have to be statistically selected. This is the position this study pursued and therefore 25 pilot subjects were selected and used for the purposes of pilot testing of validity and reliability of the research instruments. The instrument was also checked using the criteria presented by Bell (2005) that, a pilot test results should inform on such issues as: time spent filling the questionnaires, Clarity of instruments, that is, unclear or ambiguous questions, the question(s) the respondent felt uneasy about answering, whether in their opinion there

were any major topic omissions, whether the layout was clear and attractive and any other contents.

### **3.7.1 Validity Tests**

Validity refers to the extent to which an instrument measures what it is supposed to measure. If a measurement is valid, it is also reliable. The content of the responses given by the respondents was checked against the study objectives and evidence of content relevance, representativeness and relevance to the research variables indicated that the research instruments were valid (Joppe 2000). The study used the pilot study sample to check on the validity verifiers. Several methods were used in this study to ensure that the data used was valid, a strong indicator of the credibility of this study. Kline (2005) suggested that Mahalanobis distance is the most appropriate technique for evaluating the multivariate outliers. When this phenomena is dominant in the variables, it exposes the possibility that the variables or indeed the constraints are not good enough in measuring the phenomenon it purports to measure.

Variance Inflation Factor (VIF) test and the associated tolerance were used to determine correlations among the variables in this study in order to check on multicollinearity and pointedly expose validity issues in terms of appropriateness of the variables. Multicollinearity phenomenology is a situation where two or more predictor variables are highly correlated in a multiple regression such that one can be linearly predicted from the others with a substantial degree of accuracy (Kock & Lynn, 2012). VIF values captures the variance of variable coefficients and how they are increased because of collinearity and a VIF value greater than five implies presence of multicollinearity, further indicating the inappropriateness of the variables (Cohen, Cohen, West & Aiken 2013). Another statistical measure in this study that was used to test sampling adequacy or suitability of data used in the study is Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity. These two measures validates the data used if test so supports hence communicating that the data used is valid and good enough for the study.

### 3.7.2 Reliability Tests

Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials to enable replication of research procedures or use research tools and procedures that yield consistent measurements to satisfactorily draw conclusions, formulate theories, or make claims about the generalisability of research findings (Sekaran, 2006). To measure reliability of data collection instruments, an internal consistency technique using Cronbach's alpha was used in this study (Mugenda, 2008). Internal consistency method has higher degree of stability in comparison to other methods (Bryman, 2012; Cooper & Schindler, 2011). This method was popularized by Cronbach (2004) and it measures consistency within the instrument and assesses how well a set of items measures a particular behavior or characteristic. It is a coefficient of reliability that gives an unbiased estimate of data generalizability and therefore an alpha coefficient of 0.75 or higher indicate that the gathered data are reliable as they have a relatively high internal consistency and can be generalized to reflect opinions of all respondents in the target population (Zinbarg 2005).

The Cronbach's alpha ( $\alpha$ ) model that was used for reliability test in this study is presented in Equation 3.1.

$$\alpha = K / (K - 1) [1 - (\sum \sigma_k^2 / \sigma_{tot}^2)] \quad \text{----- Equation 3.1}$$

Where:

Where  $K$  is the number of items,  $\sum \sigma_k^2$  is the sum of the  $k$  item score variances, and  $\sigma_{tot}^2$  is the variance of scores on the total measurement (Cronbach, 2004). A commonly accepted procedure for describing internal consistency using

Cronbach's alpha is as follows:

<b>Cronbach's Alpha</b>	<b>Internal consistency</b>
$\alpha \geq 0.9$	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

However, a greater number of items in the test can artificially inflate the value of alpha and a sample with a narrow range can deflate it, so this rule of thumb should be used with caution:

### **3.8 Data Analysis and Presentation**

The process of data analysis begins after the data has been collected. During the analysis stage, several interrelated procedures are performed to summarize and rearrange data. The raw data collected from the field was transformed into information that addressed the research objectives. Conversion of raw data into information requires that the data be edited and coded so that the data may be transferred to a computer ready for computer statistical software based analysis (Zikmund et al., 2012).

Generally, moderated multiple regression (MMR) was the de-facto analysis used for this study. It was used in predicting the values of a dependent variable given the values of the four independent variables with a moderating variable as the fifth. Several studies in lean management and performance used regression modelling in analysing data obtained through field work in order to determine the direction of the relationship between two or more independent variables and a dependent variable (Chavez et al., 2013; Rahman, Laosirihongthong & Sohal, 2010).

#### **3.8.1 Moderated Multiple Regression (MMR) Model and Hypotheses Testing**

Moderated multiple regression was best suited for this study because it enabled the slope of one or more independent variables to vary across values of the moderator variable, thereby facilitating the investigation of an extensive range of relationships with the dependent variable as well as other function forms (Goode & Harris, 2007).

The computations and interpretation required by multiple regressions, usually are relatively complicated and therefore IBM Statistical Package for the Social Sciences

(SPSS) version 21.0 for Windows 10 was used as an analytical tool for the quantitative data that was generated through this study. To test the hypotheses for this study Chi-square test of independence was used to test whether any two variables were associated or were independent with each other. Z test was also used to investigate and test the hypotheses with the values of R (coefficient of correlation) and R-square (coefficient of determination) computed to determine the magnitude and direction of the variable relationships.

### 3.8.2 Relating Independent variables to the Dependent Variable (Objectives I – IV)

In order to realize objectives I - IV of this study as is stated in section 1.3, the following multiple regression model was used for analysis of the relationship.

$$Y = \beta_{01} + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \xi_1 \quad \text{----- Equation 3.2}$$

Where

Y = Dependent variable which represents the operational performance of port centric third-party logistics firms in Kenya in the model

$\beta_{01}$  = A constant factor which is also the value of the dependent variable when all the independent variables  $X_i$  assume any value, such as when  $X_i = 0$

$\beta_1 X_1$  = Regression coefficient  $\beta_1$  and the associated Quality Management ( $X_1$ ) variable, the first lean practice being studied in this research.

$\beta_2 X_2$  = Regression coefficient  $\beta_2$  associated with Waste (Muda) Management ( $X_2$ ) variable, the second lean practice being studied in this research.

$\beta_3 X_3$  = Regression coefficient  $\beta_3$  associated with Customer/Market Orientation ( $X_3$ ) variable, the third lean practice being studied in this research.

$\beta_4 X_4$  = Regression coefficient  $\beta_4$  associated with Cost ( $X_4$ ) variable. Cost variable is the fourth lean practice being studied in this research.

$\xi_1 =$  Stochastic or random disturbance term which addresses the random error or the net of all other minor inconsequential effects on the model and which have not been captured.

### 3.8.3 Relating Independent and Moderating Variables to the Dependent Variable (Objectives V)

The fifth research objective for this study is to evaluate how regulation moderate the relationship between lean practices and operational performance of third-party port-centric logistic firms in Kenya. The model on independent-moderating-dependent variables relationship (Stone-Romero & Liakhovitski, 2002) is as follows:

$$Y = \beta_{02} + \beta_i X_i + \beta_j (\sum X_i M) + \xi_2 \quad \text{-----Equation 3.3}$$

Where  $i=1, 2, 3, 4$  and  $j = 5$

The model can be written in full as:

$$Y = \beta_{02} + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 (X_1 M + X_2 M + X_3 M + X_4 M) + \xi_2 \quad \text{-----Equation 3.4}$$

Where;

$\beta_{02}$ : Is a constant factor, the value of the dependent variable when all the other variables in the MMR model assume zero value.

$\beta_i X_i$ : Coefficient of Lean Practices ( $\beta_i$ ) multiplied by their respective variables comprising Lean Practices.

$\beta_5 X_i M$ : The regression coefficient  $\beta_5$  associated with Regulation (M) which is the moderating variable of the relationship between lean practices and operational performance in this study multiplied by  $X_i$  indices.

$\xi_2$ : Stochastic or random disturbance term which addresses the random error or all other minor inconsequential effects or noise in the model which have not been captured.

The coefficient of determination ( $R^2$ ) was computed and used to test multi-collinearity between the variables. F statistics was used to test the significance of the variable weights and appropriate alphas computed for assessment at the selected significance level (5%). The measures that were used in this study were derived from several criterion, which were conceptualized and used in previous empirical studies of lean manufacturing and supply chain management (Shah & Ward, 2007). A copy of the survey questionnaire is provided under the appendices (Appendix 2) which shows the issues around which data was collected and to help in the analyses that was done in this study. A five-point Likert scale, with parts ranging from “not at all” (1) to “to a great extent” (5), were dominantly used to collect data on lean practices as a measurement scale.

A lesser proportion of the data that was collected was qualitative data and was analysed using content analysis method. Zikmund et al., (2012) describes content analysis as a method of data analysis involving systematic analysis to identify the specific information content and characteristics of the message. Open-ended questions were used because they gave the respondents a wide room to express themselves. Use of content analysis in the analysis of data in this study involved manual comparisons of various responses and probing in order to determine the extent to which they compare, differ or contradict.



## **CHAPTER FOUR**

### **RESEARCH FINDINGS AND DISCUSSION**

#### **4.1 Introduction**

This chapter delves to present the analyses undertaken with a bid to determine the lean practices and operational performance of third party port-centric logistics firms in Kenya.

#### **4.2 Response Rate**

The targeted respondents in the study were the third-party port-centric logistics firms in Kenya. A total of 164 questionnaires were administered, out of which 124 questionnaires were filled and returned. This represents a response rate of 75.6%. Fosnacht, Sarraf, Howe & Peck (2017) conjectured that a response rate of 75% and above is suitable. Babbie (1990) stated that a response rate of 50% is adequate while some authors set an adequate response rate at 75% (Zikmund et al., 2012; Cooper & Schindler, 2011). Mugenda (2008) states that a response rate of 50% is adequate, 60% and above good, and above 70% very good. A response rate of 75.6%, in cognizant of the sensitive nature of this study was considered an excellent response rate. Forty (40) port-centric logistics firms declined to participate in the survey. In a related study on impact of lean strategy on operational performance: a study of Thai manufacturing companies (Rahman, Laosirihongthong & Sohal, 2010), a response rate of 44.1% was realized.

#### **4.3 Firm Demographics**

The demographic uniqueness of management staff working in port centric logistics firms in Kenya was gathered and reviewed. The information provided in the questionnaire by the respondents was analyzed. The number of years the firm has been running logistics business in Kenya, the department the respondents have been working in, the size of the firm in terms of number of employees, the ownership structure of the organization, and the areas of logistic operations the firm is engaged in. The questionnaires were distributed through hand delivery means and left in those logistics firms for a period of seven (7) days after which they were collected. In many survey studies such as Rahman,

Laosirihongthong and Sohal (2010); Jinhua Wu, Zhang and Shroeder (2010) and Thai (2008), questionnaires were physically distributed and collected.

#### 4.3.1 Age of firm in Logistics Business

The respondents were requested to specify the age of the firms they work for and the results tabulated in Table 4.1. Few (3.2%) of the target firms were 1 year old or below while 6.5% of the firms were in business for a period between 1 and 5 years. 31.5% of the target firms were in business for a period between 5 and 10 years. Majority of the target firms, representing 58.9%, were in logistics business in Kenya for a period of 10 years and above.

**Table 4.1 Age of Firm in Logistics Business**

	Frequency	Percent	Valid Percent	Cumulative Percent
0 - 1 years	4	3.2	3.2	3.2
1 - 5 years	8	6.4	6.5	9.7
5 - 10 years	39	31.2	31.5	41.1
Over 10 years	73	58.4	58.9	100.0
<b>Total</b>	<b>124</b>	<b>100</b>	<b>100</b>	

#### 4.3.2 Respondents Work Departments

When the respondents were requested to state the departments where they work, the following were the results as tabulated in Table 4.2. Majority (58.4%) of the respondents representing 72 firms indicated that they worked in the Transport department. 32.8% of the respondents stated that they worked in the Port Operations department. 3.2% of the respondents stated that they worked in Human Resource Management department, 0.8% worked in Maintenance department, and 1.6% worked in Finance and Accounting department whereas 2.4% of the respondents worked in Sales and Marketing departments.

**Table 4.2 Respondents Work Departments**

	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative Percent</b>
Port Operations	41	32.8	33.1	33.1
Transport	73	58.4	58.9	91.9
HRM	4	3.2	3.2	95.2
Maintenance	1	.8	.8	96.0
Fin and Accounting	2	1.6	1.6	97.6
Sales and Marketing	3	2.4	2.4	100.0
<b>Total</b>	<b>124</b>	<b>100.0</b>	<b>100.0</b>	

**4.3.3 Size of Logistics Firms**

The size of the organization where the respondents worked was determined by ascertaining the number of employees working in these firms and the findings were tabulated in the Table 4.3. Majority (74%) of the targeted firms had more than 100 employees whereas few (22.8%) of the port centric firms had employees ranging between 50 and 100. 3.3% of the target firms had employees in the range of between 20 and 50.

**Table 4.3 Size of Logistics Firms**

	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative %</b>
20-50 Employees	4	3.2	3.3	3.3
50-100 Employees	28	22.4	22.8	26.0
>100 Employees	91	72.8	74.0	100.0
<b>Total</b>	<b>123</b>	<b>100.0</b>	<b>100.0</b>	

#### 4.3.4 Logistics Firms Ownership Structure

When the employees were asked to indicate the ownership structure of the firms they were working in they came up with the following feedback as in table 4.4. Few (6.5%) indicated that port centric logistic firms were owned by locals while majority (93.5%) stated that many of these firms are owned by both local and international citizens. A similar study by Mentzer, Flint and Hult (2001) on Logistics service quality as a segment-customized process had a scenario with firms' ownership largely taking the mixture of local and foreign ownership. With this kind of structure, the expectation is that these logistics have largely a global approach to logistics management.

**Table 4.4 Logistics Firms Ownership Structure**

	<b>Frequency</b>	<b>Percent</b>	<b>Valid Percent</b>	<b>Cumulative %</b>
Local	8	6.4	6.5	6.5
Foreign & Local	116	92.8	93.5	100.0
<b>Total</b>	<b>124</b>	<b>100.0</b>	<b>100.0</b>	

#### 4.3.5 Areas of Logistic Operations

All (100%) of the firms were engaged in container leasing, transport and clearing operations while 98.4% of the third-party port-centric logistic firms in Kenya were involved in port services. Table 4.5 further indicates that 96.8% of the third-party port-centric logistic firms in Kenya are engaged in cargo consolidations logistics operations. 29.8% of the firms that responded indicated that they engaged in ocean carrier logistics operations. Only 0.8% of the port centric logistic firms in Kenya dealt with other operations. This is comparable to a study on quality management in logistics which was an examination of industry practices where most of the logistics firms surveyed engaged in cargo consolidation services, port services and transport logistics (Rahman 2006). Third party logistics services in Kenya is largely port outbound, Kenya being a skewed net

importer. This implies that much of the activities around port are more or less cargo clearance, port services and cargo clearance.

**Table 4.5 Areas of Logistic Operations**

Logistics Area	Responses		Percent of Cases
	N	Percent	
Container Leasing	124	19.0%	100.0%
Transport	124	19.0%	100.0%
Ocean Carrier	37	5.7%	29.8%
Port Services	122	18.7%	98.4%
Clearing Agent	124	19.0%	100.0%
Cargo Consolidators	120	18.4%	96.8%
Others	1	0.2%	0.8%

#### **4.4 Description of the Factors of the Study Variables**

The description of the study variable factors is displayed in the Appendix III. This description was quite helpful in cross referencing since the factors were used in data analysis, model analysis, and throughout the entire study. Quality management practice had 5 factors, lean waste management had 4 factors, lean customer orientation management had 5 factors, lean cost management had 5 factors, Regulation had 4 factors and operational performance had 7 factors. In total this study utilized a total of 30 factors. The description further captured the groupings of these factors into corresponding sub-constructs.

#### **4.5 Reliability and Correlations of the Study Variables**

Reliability is the extent to which an experiment, test, or any measuring procedure yields the same result on repeated trials to enable replication of research procedures or use research tools and procedures that yield consistent measurements to satisfactorily draw conclusions and apply the results or findings of the study (Sekaran, 2006). To measure

reliability of data collection instruments, internal consistency technique was used. Cronbach's alpha value was computed and the findings are presented in Table 4.6 and Table 4.9.

Coefficient of reliability gives an unbiased estimate of data generalizability and therefore an alpha coefficient of 0.75 or higher indicates that the gathered data are reliable as they have a relatively high internal consistency and can be generalized to reflect opinions of all respondents in the target population (Zinbarg, 2005). Reliability and correlations of data were done on the pilot data to ensure the instruments were good to go before data collection and after data collection to confirm that the instruments remained as good with the actual field data.

#### **4.5.1 Reliability Test for Pilot Study**

This study conducted a pilot study using 25 pilot subjects. It is important to note that the size of pilot group may range from 25 subjects to 100 subjects depending on the method to be tested and that the subjects do not have to be stochastically selected (Cooper & Schindler, 2011). The pilot study respondents were picked from amongst University of Nairobi Master of Business Administration undertaking Operations Management (OM) specialization most of whom were well aware of third party port-centric logistics service providers in Kenya. The results of the analysis of the responses from the 25 respondents are presented in table 4.6 and table 4.7.

**Table 4.6 Pilot Study Reliability Results**

Cronbach's Alpha	Cronbach's Alpha - Standardized Items	N of Items	N
.879	.870	5	25

From the overall test of reliability, the Cronbach's Alpha value for the five independent variables was found to be 0.87 as indicated in table 4.6, and which is a true reflection of the variable variances by taking care of the variations within individual variables. This implied that the variables of the study were estimated to be reliable even before the fieldwork exercise was undertaken.

**Table 4.7 Inter-Item Correlation Statistics for Pilot Data**

<b>Study Variables</b>	<b>Quality Mgt</b>	<b>Waste Mgt</b>	<b>Customer Orientation</b>	<b>Cost Mgt</b>	<b>Regulation</b>
Quality Mgt	1.000	.139	.770	.901	.777
Waste Mgt	.139	1.000	.180	.299	.203
Customer Orientation	.770	.180	1.000	.730	.953
Cost Mgt	.901	.299	.730	1.000	.776
Regulation	.777	.203	.953	.776	1.000

On the correlations of variables when paired, table 4.7 show that all the variables had positive correlations and a number of them with correlations towards 1 ( $>0.5$ ). For the pilot data, table 4.8, shows that all the variables apart from waste management were better off being in the model because by deleting or removing them from the variables, the alpha value was worse off than the alpha value for the entire model. For instance, removing customer orientation from the model, the alpha value now be  $0.824 < 0.879$ . In the final questionnaire, waste management section was analysed for improvements of the reliability.

**Table 4.8 Item Correlation and Reliability Statistics**

	Sc. Mean- Item Deleted	Sc. Variance- Item Deleted	Corrected Item-Total Correlatio n	Sq. Multiple Correlation	Cronbach's Alpha if Item Deleted
Quality Mgt	7.4576	.760	.822	.858	.827
Waste Management	7.6403	1.083	.214	.184	.937
Cust. Orientation	7.6488	.603	.855	.917	.824
Cost management	7.4733	.813	.851	.862	.829
Regulation	7.6413	.693	.897	.924	.805

**4.5.2 Study Reliability Test Results**

The overall test of reliability for all the variables produced Cronbach's Alpha value of 0.764 based on standardized values. This was slightly above the excellent threshold value of 0.75 ( $\alpha \geq 0.75$ ). This finding meant that the variables are reliable enough and that the data collected and analysed for this study produced results that can be relied on and good enough for replication and generalization.

**Table 4.9 Study Cronbach's Alpha Test Results**

Cronbach's Alpha	Cronbach's Alpha - Standardized Items	N of Items	N
.764	.755	5	123

On the correlations of paired variables in the final data analysis, the generated results in table 4.10 indicated that all the variables had positive correlations. The weakest paired correlation was between cost management and regulation (0.221) whereas the strongest paired correlation was between quality management and customer orientation management (0.695).



**Table 4.10 Inter-Item Correlation Statistics Results for the Study**

Study Variables	QualityMgt	WasteMgt	CustOMgt	CostMgt	Regulation
QualityMgt	1.000	.666	.695	.411	.478
WasteMgt	.666	1.000	.657	.541	.352
CustOMgt	.695	.657	1.000	.515	.403
CostMgt	.411	.541	.515	1.000	.221
Regulation	.478	.352	.403	.221	1.000

Inter-item correlation and reliability analysis was conducted on all the predictor variables and the results are presented in Table 4.1. All the variables had a positive influence in the model because by deleting or removing them from the variables, the Cronbach alpha-value would be worse off than the alpha-value for the entire model. For instance, by removing customer orientation management from the model, the alpha value would drop from 0.764 to 0.614. This was the expected behavior of the variables for a strong and reliable. Literature supports that Cronbach's Alpha coefficient of 0.75 or higher as an indicator that the gathered data is reliable with high internal consistency and can be generalized to reflect opinions of all respondents in the target population (Zinbarg 2005).

**Table 4.11 Item Correlation and Reliability Statistics**

	Sc. Mean- Item Deleted	Sc. Variance- Item Deleted	Corrected Item-Total Correlation	Sq. Mult. Correlation	Cronbach's Alpha if Item Deleted
QualityMgt	12.4542	3.533	.629	.581	.684
WasteMgt	11.9427	1.816	.729	.714	.564
CustOMgt	12.0650	2.594	.628	.555	.614
CostMgt	12.3195	3.186	.500	.555	.677
Regulation	13.6750	3.462	.208	.078	.745

#### **4.6 Test of Assumptions of the Study**

It is paramount to validate the tests for assumptions of linear regression models so as to provide consistent estimates of parameters that are devoid of bias (Kothari, 2012). This study evaluated the assumptions by testing for normality, multicollinearity, heteroscedasticity, outliers and Sampling Adequacy Test. Lundahl and Silver (2014) also tested for these parameters to ascertain the assumptions of linear regression models.

##### **4.6.1 Test of Normality**

Normality test is usually conducted to discover whether the data set follows the characteristics of a normal distribution (Paul & Zhang, 2010). There are different approaches to test for normality using statistical software such as IBM SPSS version 21. The most common way of test is through skewness and kurtosis tests. Kurtosis is an indicator of a degree flattening of a distribution while Skewness is as a sign of asymmetry and deviation from a normal distribution. Skewness values that range from -3 to +3 are generally considered good enough (Onwuegbuzie & Daniel, 2002).

The data collected on all the study variables was tested for normality using skewness and kurtosis and results presented in Table 4.12 (a complete summary is available in Appendix IV). Skewness values were within the range +/-3 for all the variables whereas the coefficients of kurtosis were between -0.531 and 9.176 (a value of 3.0 is considered normal) showing a good moderate balance between platykurtic and leptokurtic distributions around the normal distribution. Kurtosis and skewness were used to test normality by Rocha, Farazi, Khouri and Pearce (2011) in their study on the status of bank lending to SMEs in the Middle East and North Africa.

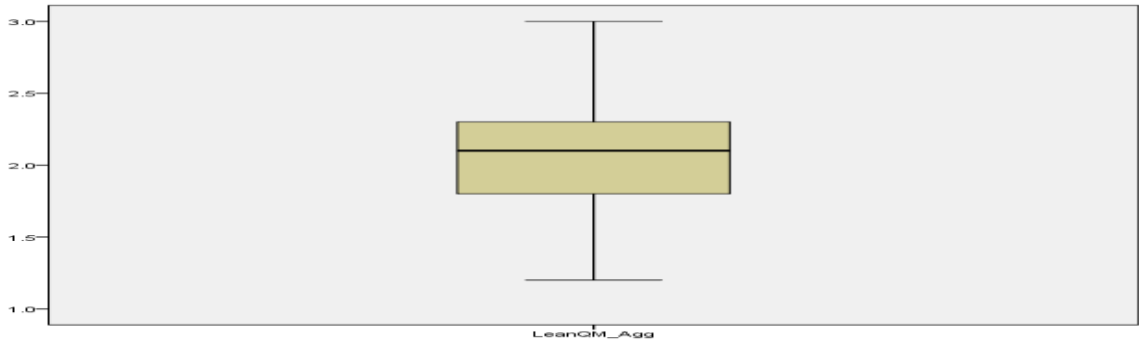
**Table 4.12 Normality Test Using Skewness and Kurtosis**

<b>Variables</b>	<b>N</b>	<b>Std. Dev</b>	<b>Skewness</b>	<b>Kurtosis</b>
QualityMgt	124	.27699	.047	1.620
WasteMgt	124	.86530	1.262	8.937
CustOMgt	124	.62985	.143	-.531
CostMgt	124	.47680	-1.619	9.176
Regulation	124	.58876	1.754	4.302
OpsPerf	123	.38980	.463	.449

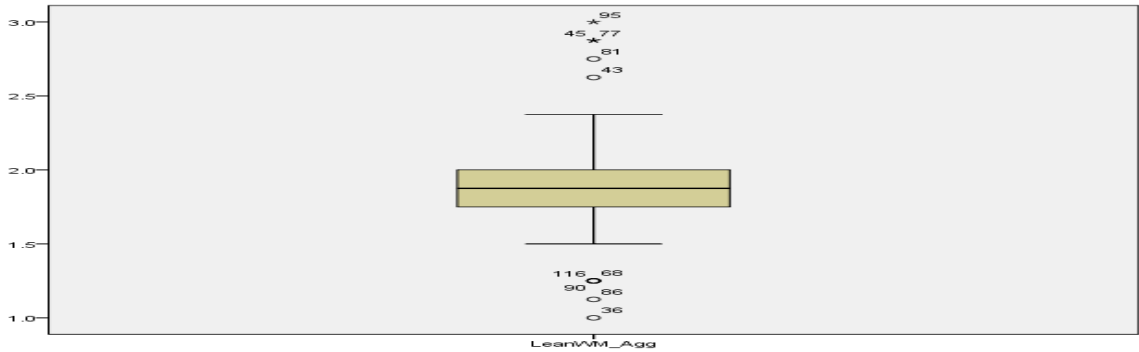
#### **4.6.2 Test for Outliers**

To calculate the multivariate outliers Mahalanobis distance was used. Multivariate outliers are the unusual grouping of values for several variables that was analysed through this test. Kline (2005) suggested that Mahalanobis distance is the most appropriate technique for evaluating the multivariate outliers. Mahalanobis  $D^2$  (multidimensional version of a z-score) was used to compute the space of each case from the centroid (multidimensional mean) of a data distribution. A case is a multivariate outlier if the likelihood associated with its  $D^2$  is 0.001 or less.  $D^2$  patterns follow a chi-square distribution with degrees of freedom equaling the number of variables included in the computation (Tabachnick & Fidell, 2007).

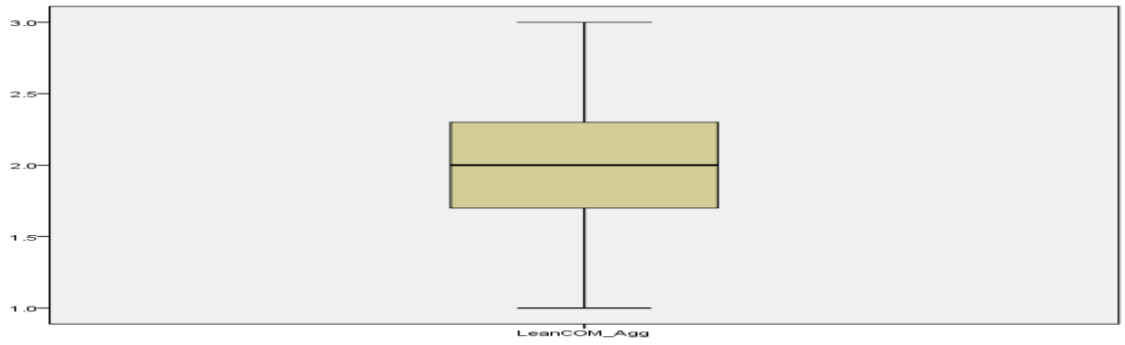
The results for the Mahalanobis test are presented in appendix V which shows that the Mahalanobis  $D^2$  range from 0.476 to 16.757 with  $p^2$  values being greater than 0.05 hence portentous that occurrence of multivariate outliers are not in existence. Allada and Jayanth (2006) used Mahalanobis distance to test for outliers in their study on application of Mahalanobis Distance as a Lean Assessment Metric. In addition Mahalanobis d-squared produced a reasonable box plots as displayed in Figure 4.1 to Figure 4.6, where all the variables are symmetrical and with no considerable outliers detected. It is usually considered that multivariate outliers are often a rare conglomeration of scores on a number of variables (Tabachnick & Fidell, 2007). The findings are supported by the previous results of Mahalanobis  $D^2$ -test in Appendix V on the general absence of outlier values in the variables used in this study. The results of box plots are presented using the box plots by Figures 4.1 to 4.6.



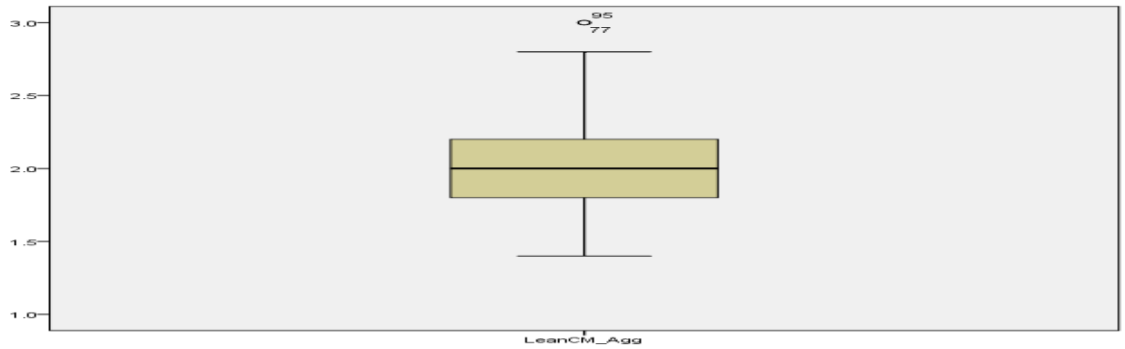
**Figure 4.1 Box Plot of Quality Management**



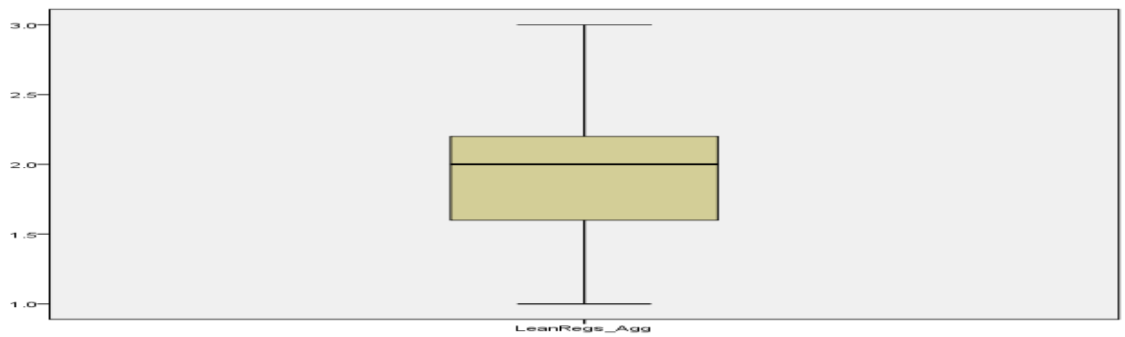
**Figure 4.2 Box Plot of Waste Management**



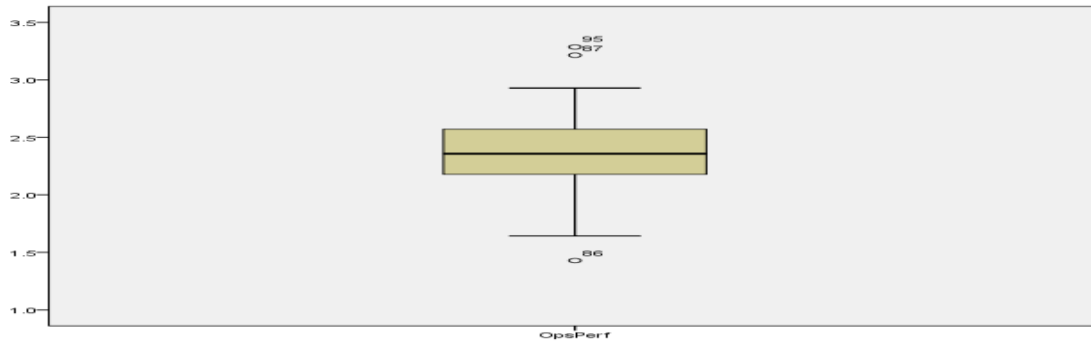
**Figure 4.3 Box Plot of Customer Orientation Management**



**Figure 4.4 Box Plot of Cost Management**



**Figure 4.5 Box Plot of Regulation**



**Figure 4.6 Box Plot of Operational Performance**

### **4.6.3 Test for Heteroscedasticity**

Heteroscedasticity refers to a circumstance in which the variability of a variable is unequal across the range of values of a second variable that predicts it (Engle, 1982). Heteroscedasticity was tested in this study by using the Chi- square test. Chi- square test is a statistical hypotheses test wherein the sampling distribution of the tests statistic is a chi-square distribution when the Null hypotheses is true (Rao & Holt, 2005). Chi-Square Test of Independence was used in this study to compare categorical variables. Additionally, the Chi-Square Test of Independence was therefore used to assess associations between categorical variables, although it provides no inferences about causation. The null hypotheses ( $H_0$ ) and alternative hypotheses ( $H_1$ ) of the Chi-Square Test of Independence/association was expressed as follows:

**$H_0$ : Variable Xi (independent) is independent of variable Y (dependent)**

**$H_1$ : Variable Xi (independent) is not independent of variable Y (dependent)**

Evidence of Heteroscedasticity is confirmed when the value of Prob > the computed value of the Chi-square is less than 0.05 (Park, 2008). Table 4.13 shows that the constant variance (Chi2 values are) were statistically significant with probability values  $p < 0.05$ . Since all the Chi-square values (3233.533, 5016.806, 4549.770, 4692.621 and 5541.492) are greater than the corresponding probability values (.000, .001, .000, .000 and .000), the

null hypotheses was rejected and concluded that there was a statistically significant association between all the independent variables (quality management, waste management, customer orientation, cost management and regulation) and operational performance of third party port-centric logistics firms in Kenya. Brook (2010) tested for heteroscedasticity using the Chi-square test in his book on lean six Sigma and minitab: The Complete Tool Box guide for all Lean Six sigma Practitioners.

**Table 4.13 Heteroscedasticity Test Results**

	Value of Pearson Chi-Square	df	Asymp. Sig. (2-sided)
QualityMgt *OpsPerf	3233.533	1288	.000
WasteMgt*OpsPerf	5016.806	4692	.001
CustOrientMgt*OpsPerf	4549.770	3772	.000
CostMgt*OpsPerf	4692.621	3266	.000
(Xi*Reg)Comb*OpsPerf	5541.492	5198	.000

#### 4.6.4 Multicollinearity Test

Multicollinearity phenomenology is a situation where two or more predictor variables are highly correlated in a multiple regression such that one can be linearly predicted from the others with a substantial degree of accuracy (Kock & Lynn, 2012). It is an undesirable situation where two or more predictor variables in a multiple regression model are highly associated such that one can be linearly predicted easily. The presence multicollinearity in variables of the study increases the chances of standard error of the coefficients with resultant effect keeping variables that are significantly similar (Schroeder, 1990). When there are variables that have a VIF greater than 5, then use of these variables must be reconsidered by either merging them or altogether removing them from the regression model (Ethington, 2012).

Variance Inflation Factor (VIF) test and the associated tolerance were used to determine correlations among the variables in this study. VIF values captures the variance of variable coefficients and how they are increased because of collinearity and a VIF value greater than five implies presence of multicollinearity, further indicating the inappropriateness of the variables (Cohen, Cohen, West & Aiken 2013). Tolerance measures the impact of collinearity among the variables in a regression model and is computer using the expression  $(1 - R^2)$ .

The closer the tolerance value to 1, the less is the multicollinearity, and closer to 0 shows increase in presence of multicollinearity (Belsley, Kuh & Welsch, 2004). Table 4.14 shows the VIF and the Tolerances values that were computed for the predictor variables of the this study. The VIF values range from 1.088 to 2.802 (VIF values < 5.00) which shows the absence (lack of evidence) of undesired multicollinearity effect amongst the study variables. Chang, Liao, Yu, and Ni (2014) tested multicollinearity using the VIF and tolerance approach.

**Table 4.14 Multicollinearity Test Results**

<b>Variables</b>	<b>VIF (1/1-R<sup>2</sup>)</b>	<b>Tolerance (1-R<sup>2</sup>)</b>
QualityMgt	2.496	.401
WasteMgt	2.802	.357
CustOMgt	2.236	.447
CostMgt	1.504	.665
Regulation	1.088	.919

#### **4.6.5 Sampling Adequacy Test**

In order to test sampling adequacy or suitability of data used in the study, Kaiser-Meyer-Olkin (KMO) and Bartlett's Test of Sphericity were used. KMO value gave an index which explains the degree of variances in the study variables that emanated from the underlying factors. KMO value approaching 1 ( $\leq 1$ ) implies that factor analysis would work for the



data, a good indicator that the factors used in the study were good enough (Pallant, 2010). On the other hand, Bartlett's Test of Sphericity test is an indicator of whether variables used in the study were related/unrelated positing suitability of structure detection. Table 4.14 indicates a strong result of sampling adequacy where KMO value is 0.741, a value close to 1. The Bartlett's Test of Sphericity Test, with  $p < 0.05$  is an indication of suitability of data for structure detection. These tests therefore confirmed that the data set used in this are suitable for the analyses in this study.

**Table 4.15 KMO and Bartlett's Test Results**

KMO Test of Sampling Adequacy	Bartlett's Test of Sphericity
.741	Approx. Chi-Square 253.324
	df. 10
	Sig. 0.000

#### **4.7 Descriptive and Qualitative Analysis of the Study Variables**

The research instrument was largely conceptualized into three sub-sections for each of the research variable. The first two sub-sections consisted of closed and open ended questions. These questions provided respondents with two alternatives of either responding in the affirmative or in the negative. In the first sub-section, an affirmative answer required the respondent to tick the “Yes” box while the negative response required ticking of No box. In the second sub-section, the respondents were asked to respond to open ended questions where they were asked to highlight the areas in which the management of their firm had put emphasis on to ensure high quality deployment to customers and quality management practices they were aware that are meant to boost service quality in their organization. In

the third sub-section, all respondents were subjected to a Likert scale table. In this way, every aspect of the variable was addressed and consequently analyzed.

#### **4.7.1 Descriptive Analysis of Quality Management of Third Party Port-Centric Logistic Firms in Kenya**

The first objective of this study was to determine the relationship between quality management and operational performance of third-party port-centric logistic firms in Kenya. In order to attain this objective, the respondents were asked to indicate their level of agreement or disagreement with various lean issues in their organization. On whether the firm had any formal Quality Management System (QMS), majority (92.7%) of the respondents indicated that indeed they had QMS while few (7.3%) thought otherwise as shown in table 4.16. Firms that adopt lean as an ideology must not only seek to deal with waste in their production processes but as well be at the forefront value creation and offering to the customers by providing quality products and services (Jinhui Wu, Zhang & Shroeder, 2010). The fact that majority of the firms (92.7%) in this study had a form of quality management system in place is not just a coincidence but evidence that many firms are in a journey seeking improvement, excellence and superior performance.

**Table 4.16 Adoption of Quality Management System (QMS) by Port-Centric Logistic Firms**

		<b>Frequency</b>	<b>Valid %</b>	<b>Cum. %</b>
Valid	YES	115	92.7	92.7
	NO	9	7.3	100.0
	Total	124	100.0	

On whether the port-centric logistics firms in Kenya conduct quality surveys majority (96.8%) of the respondents agreed that they conduct quality surveys in their firms as shown in table 4.17. Only 3.2% of the respondents stated that they do not conduct quality surveys in their organizations. The challenge in many firms in the journey of continuous

improvement is the formality of the journey. When firms enter the quality race they must as well be ready to formally follow through with documentation (Kannan & Tan, 2005). Quite a number of third party port-centric logistic firms are in quality journey as shown in table 4.17 and the expectation is the formality of the process which one of the yardstick is quality checks and quality surveys.

**Table 4.17 Whether Logistic Firms Conduct Quality Surveys**

	<b>Frequency</b>	<b>%</b>	<b>Valid %</b>	<b>Cum. %</b>
Valid YES	120	96.8	96.8	96.8
NO	4	3.2	3.2	100.0
<b>Total</b>	<b>124</b>	<b>100.0</b>	<b>100.0</b>	

When the respondents were asked on the areas the management of the firms has put emphasis on to ensure high quality deployment to customers, the responses were varied and most were as follows: fleet management, transport management that controls all transport affiliated departments, quality control, clients reception, records management, administration department, customer care relationship (help desk), customer care management and administration and feedbacks front office management, transport department, container leasing, human resource department and port services.

On quality management practices that were meant to boost service quality in the organization, training of all operations personnel was identified as critical. Other responses were varied and included: records management, customer care and relationship management, ICT based documentation and data records system, administrative support services, electronic discovery services, regular customer appraisal, facilities support management, fleet management, data entry/data management, fleet and equipment management, employee trainings on various departmental matters and enterprise content management.

These findings are supported by the fact that in service management training, use of technology, customer service and customer feedback mechanisms are all very important in the superior service journey (Jinhui Wu, Zhang & Shroeder, 2010). This standpoint is validated by the fact that in Kenya the third party logistics services are often clogged with a lot of inefficiency emanating from a myriad of factors. These factors include; the multi-player regulatory environment, infrastructure challenges and challenges of handling and internal port operations issues. In order to ascertain how third-party port-centric logistics firms practice lean, the respondents were asked to indicate in a Likert scale the mean monthly frequency at which lean issues had been experienced in their firms in the last one year.

The respondents were also asked to generally indicate how often the lean issues were practiced in their firms. When asked to indicate the frequency of breakdown of equipment (cranes, operations vans/cars, and others) affecting logistics operations in the last one year, majority (82.3%) indicated that once in a while they experienced breakdown of equipment 1-5 times whereas few (8.7%) affirmed that they had equipment break down 6-10 times and a further 8.1% indicating that they did not experience any breakdown of equipment during the same period as shown in Appendix VI. Still on the same lean issue, when asked to indicate the frequency at which they experienced equipment breakages, majority (70.4%) indicated they experienced this lean issue sometimes, followed by 25.2% of the respondents who indicated that they rarely experience this issue. 2.4% of the respondents indicated that they often experience breakage of equipment. There was concurrence that break downs were common phenomenon in all the logistics firms (Appendix VI).

It is important to note that for any service encounter or offering to succeed service accompaniments must be up and running. Actually, one of the indicators of operational performance in regard to equipment, is the time when that equipment was actually available compared to the planned utilization. When equipment are not well maintained or repaired on time when they breakdown, it negatively affect the operational performance of a firms. (Bayou & de Korvin, 2008). For third party port-centric logistics firms to offer

customer satisfying services, their equipment must guarantee an exciting service by ensuring they are always in good state. This is inevitable if the firms must walk the lean journey and a quality race.

On the rate at which jobs and tasks are repeated because of human mistakes, majority (73%) experienced this quality issue 1-5 times, while 21% did not experience it, Appendix VI shows that. A few (4%) indicated that jobs and tasks were repeated due to human mistakes 6-10 times, a monthly average in the past one year. On the frequency of this phenomenon, majority (74.2%) indicated they sometimes experienced this situation, followed by 21% who stated it was rare to encounter jobs and tasks repeated due to human mistakes. Only a meager (2%) indicated they never had this situation in their firms.

On the frequency of damaged cargo during movement to and from the port/yard/CFS for the last one year of operations, majority (46.6%) of the respondents indicated damaged cargo was witnessed during movement 1-5 times as shown in Appendix VI. This was followed closely (31.4%) 6-10 times, with few (22%) with zero (0) occurrences on average for past one year and a further 4.8% of the respondents choosing not respond to this question. The frequency of occurrence of damaged cargo during movement, majority (73.4%) of the respondents affirmed that this was rarely experienced, with 22.6% of the respondents indicating they had never, with the least (4%) number of respondents acknowledging they sometimes experienced damaged cargo when they are being moved.

One nasty side of poor quality services in logistics is damaged cargo and accumulation of demurrages charged to over-stowage and excess handling. These can be eliminated if port-centric logistics services providers work closely with the customers by ensuring their services are customer centric (Flint et al., 2005; Thai, 2008). This is in synch with the findings of this study. Similarly, it is true that third party port-centric logistics firms in Kenya are customer conscious because although with so many challenges in the logistics business they are able to manage ‘nasty side of poor logistics services’, the damaged cargo and the demurrages.

When asked to state the mean monthly frequency of occurrence of demurrage accumulation for cargo that is late in handling or delivery/picking, as shown in Appendix VI, majority (75.4%) affirmed that they had this phenomenon on 1-5 times, with 21% stating they had not experience of the same. Only a few (6.6%) respondents acknowledged that the phenomenon was an issue 6-10 times on average in the last one year, with only 1.6% non-response. Appendix VI further displays the results of ratings of this issues on the basis of frequency, where the majority (72.4%) of the respondents affirmed that they sometimes experience this issue followed by 23.2% of the respondents indicating that they rarely experience demurrages for cargo. A minority (2.2%) of the respondents affirmed that they often experienced demurrages in their firms as a result of late handling or delivery/picking of cargo. 1 respondent (0.8%) did not respond to this question.

On the sub-construct of demurrages (Appendix III), the computations show that majority (74.2%), when asked to indicate whether customer complaints usually ignored in planning and making changes in logistics plans, indicated that it indeed happed in 1-5 times with another 21% indicating that it has never happened. A minority (4.8%) of the respondents indicated that they had ignored customer complaints 6-10 times in the same period of operations. In terms of frequency, majority (75.4%) of the respondents affirmed that they rarely ignored customer complaints with a few (6.6%) reported by the respondents indicating their firms sometimes ignored customer complaints. Another group (18%) of respondents did indicate that their firms had never ignored any customer complaints when planning and making changes in their logistics plans with trivial (2) respondents registering a no-response to this question.

Success in service offering requires a mechanism for detecting service failures and critically service failure points early and fast enough to avoid poor service escalation to avoid customer perception dwindle. In third party port-centric services providers, detection of damaged cargo and handling of customer complaints and feedback are critical to superior and quality services (Bhasin, 2011). Any firm seeking to enhance quality must hear and respond to the customers' voice and solve the issues they raise while effectively

providing feedback. Based on the evidence provided by this study, third party port-centric logistics firms in Kenya seem to be on the right path. They must however roll the journey together with the customer, since quality is not an event but indeed a learning process together.

#### **4.7.2 Descriptive Analysis of Waste Management of Third-Party Port-Centric Logistics Firms in Kenya**

The second objective of this study was to find out the relationship between waste management and operational performance of third-party port-centric logistic firms in Kenya. In order to attain this objective, the respondents were asked to indicate their level of agreement or disagreement with various lean waste management issues in their organization. As a variable, waste management had three sub-constructs (Frequency of cargo handling, equipment availability and logistics personnel availability) on which three statements were generated to represent the sub-constructs (Appendix III). To begin with, the respondents were asked to state on whether the logistics firms had efficient ways of managing personnel shifts and schedules to ensure efficient work flow in order to minimize man power wastages. The response on this lean aspect as shown in table 4.18 was as follows, that is, majority (98.4%) affirmed presence of efficient ways of managing personnel shifts and schedules while 1.6% stated that they did not have any such a system whereas one (1) respondent did not respond to this question.

**Table 4.18 Efficiency in Shift and Schedule Management**

		<b>Frequency</b>	<b>Valid %</b>	<b>Cum. %</b>
Valid	YES	121	98.4	98.4
	NO	2	1.6	100.0
	<b>Total</b>	<b>123</b>	<b>100.0</b>	

The respondents were asked to select from a list provided the lean waste management issues their third-party port-centric logistics firms had implemented in order to deal with wastage of any aspect. Cycle time reduction and management was highly (97.6%) rated followed by Set up time reduction and management (97.6%), as shown in table 4.19. Tying as the third most implemented waste management issue, were continuous workflow of equipment, materials and personnel and equipment maintenance and replacement (96.8%). On extent of implementation of lot sizes for efficient handling of cargo (92.7%) came a distant fifth in the ranking and lastly elimination of bottlenecks in their operations and logistics (89.5%).

**Table 4.19 Waste Management Implementation Issues**

<b>Waste Management Issue</b>	<b>Freq (N=124)</b>	<b>% Score</b>	<b>Ranking</b>
Set up time reduction and management	121	97.6	2
Lot sizes for efficient handling	115	92.7	5
Continuous Workflow of equipment	120	96.8	3
Bottlenecks elimination in operations	111	89.5	6
Equipment maintenance and replacement	120	96.8	3
Cycle time reduction and management	123	99.2	1

Any organization practicing lean requires to achieve continuous reduction in waste in all of its activities. To complete this journey, there has to be a coordinated effort and internal firms' alignment within this reality in order to move towards achieving leanness in all areas of operations (Xu & Beamon, 2006; Emiliani et al., 2007). The results of this study indicates that port-centric logistics firms in Kenya manages their personnel well and had well-orchestrated mechanisms for curbing waste as evidenced by the findings of this study. To know how third party port-centric logistics firms practice lean, the respondents were asked to indicate in a Likert scale the frequency lean waste management issues had been experienced in their firms in the last one year. This section addressed three sub-



constructs of lean waste management (Frequency of handling, equipment availability and customer helpdesk) as shown in figure 2.3. The respondents were required to respond to statements on the frequency of handling.

On mean monthly frequency of equipment and machines picking and dropping cargo in wrong places in the last one year, majority (87.7%) stated that equipment and machines picked or dropped cargo in wrong places 1-5 times whereas few (4.1% and 1.6%) indicated that they experienced such an issue 6-10 and 11-20 times respectively in the same period, as shown in Appendix VII. A number (8.2%) of respondents indicated that the issue has never been experienced in the last year of operations, with only 1.6% of the respondents stating. The respondents were also requested to indicate the frequency with which they experienced this issue, a majority (74%) of the respondents affirmed that they rarely experienced equipment/machines dropping/picking cargo in the wrong places whereas as 4% only experience this phenomenon only sometimes with a further 21% of the respondents affirming that they had never experienced such an issue.

On whether they are engaged in non-value adding activities and tasks in cargo handling in the past one year of logistics operations, shown in Appendix VII, majority (73.4%) of the respondents agreed that they had done so 1-5 times whereas fewer (22.6%) agreed that they never engaged in non-value adding activities and tasks for the past one year of their operations. Another 1.8% and 0.8% of the respondents affirmed that the phenomenon occurred on 6-10 and 11-20 times respectively during the past one year of their operations. On how frequently this happened, majority (85.2%) of respondents stated they rarely engaged in non-value adding activities in handling whereas a much less (8.1%) number of the respondents stating to never have they engaged in non-value adding activities and tasks. Only a handful (4.1%) indicated that they had sometimes engaged in such activities

Lean is a business model that focuses on changing and improving processes to eliminate waste (Motwani, 2003). Often scholars have shown that lean practices and operational performance have a significant positive relationship practices such as, implementing

preventive maintenance activities, reducing setup time, reducing inventory, waste reduction, continuous/one piece flow, and removing bottlenecks (Chavez et al., 2013; Rahman, Laosirihongthong & Sohal, 2010). Further, the results from this study concur with findings that many (87.7%) of the third party port-centric logistics firms in Kenya have put in place measures to curb wastage in unnecessary movements and a further 73.4% unintentionally engaged in non-value adding activities only 1-5 times on monthly average. This consequently implies that third party port-centric logistics firms in Kenya are on a journey towards true lean agents resulting into supply chain boost.

On the same construct of waste management, respondents were asked to state the mean monthly frequency their firms engaged in quick fix repairs on broken logistics equipment. Majority (77.6%) stated 1-5 times followed by those (16.4%) who stated never had they, that they stick to maintenance schedules, as shown in Appendix VII. Only 5.3% of the respondents agreed that they had engaged in repair of broken down logistics equipment 6-10 times during the last year of their operations. When requested to state the frequency this issue occurred in their firms, majority (77.1%) of the third party port-centric logistics firms affirmed they rarely engaged in such activities whereas as a far less (17.7%) never got involved in such activities with a further 4.4% agreeing that they sometimes engaged quick fix repairs of broken down logistics equipment.

In logistics operations cycle time is a critical indicator of operational efficiency and which is largely influenced by availability of equipment and the technical personnel. Due to the technical nature of gantry cranes, chassis and movers, technical personnel such as drivers and support team is a critical presence for any peak cargo logistics handling (Bhasin, 2011). The findings of this study indicate that third party port-centric logistics firms in Kenya have largely invested in and implemented systems and processes for ensuring wastage of time and resources through extra handling is curbed. The situation however is that much more improvements is needed to reduce these cases to near zero.

As shown in Appendix VII, majority (77.6%) of the respondents agreed experiencing personnel shortage in the logistics function during peak times 1-5 times as compared to the number (17.7%) that affirmed of having never experienced such a logistics issue in the past year of operations. A much less (5.6%) of the respondents stated they had experienced this phenomenon 6-10 times during the past one year of their logistics operations. On how often, third party port-centric logistics firms had experienced shortage of personnel in the logistics function during peak times, majority (73.4%) stated they rarely while a lesser (23.4%) number affirming of never encountered the issue. Only 3.2% of third-party port-centric logistics firms affirmed they had sometimes experienced this issue.

The best way for any organization to boost its performance is by saving on cost and the surest way of dealing with wastage is to improve on efficiency and effectiveness of application of the resources at the firms' disposal (Dhandapani, Potter & Naim, 2004; Bayou & de Korvin, 2008). Implementation of lean waste management is a clear challenge but definitely requires much improvements. For instance, many (76.6%) of the third party port-centric logistics firms in Kenya experienced critical logistics personnel and almost as many (77.6%) also experienced quick fix repair of logistics equipment, all shortage 1-5 times. This is an indicator that these firms are not there yet but clearly the effort towards a lean firm in the area of waste management is with no doubt.

#### **4.7.3 Descriptive Analysis of Customer Orientation of Third-Party Port Centric Logistics Firms in Kenya**

The third objective of this study was to establish the relationship between customer orientation and operational performance of third party port-centric logistic firms in Kenya. Customer orientation had three sub-constructs; customer helpdesk, wide customer care awareness and feedback/feedforward mechanism. In order to attain this objective, the respondents were asked both open ended and closed ended type of questions. To begin with, the respondents were asked to state whether third-party port-centric logistics firms

in Kenya had specific and elaborate programmes for recruiting and sustaining the logistics customers. Majority (91.9%) of the respondents affirmed that they did not have such programmes, whereas only a few (7.3%) of them affirmed they had such programmes, 0.8% of the respondents choosing not to respond to this question as shown in table 4.20. Only a few (7.3%) respondents confirmed existence of such programmes in their firms and opined that they achieved them through customer segmentation especially those requiring long term services, adverts and sending the most qualified marketing staff to prospect for potential customers. They also stated that they also conduct customer recruitment through other customers.

**Table 4.20 Presence of Specific and Elaborate Programmes for Customer Recruitment**

		<b>Frequency</b>	<b>Valid %</b>	<b>Cum. %</b>
Valid	YES	9	7.3	7.3
	NO	114	91.9	99.2
	No Response	1	0.8	100.0
<b>Total</b>		<b>124</b>	<b>100.0</b>	

On whether third-party port-centric logistics firms in Kenya were flexible in tailoring services to meet customer needs, as presented in Appendix VIII, majority (65%) of the respondents explained that due to varying customer needs, they needed flexible logistics operations for customers and their firms had tailored logistics systems to serve customers better and profitably. This they stated was by striving to always fix fast logistics problems that required immediate attention. On the same issue, much less (30%) of the third party port-centric logistics firms in Kenya did not have elaborate plans for ensuring flexible logistics operations. About 5% of the respondents returned a non-response to this question.

When asked to explain the level of employee sensitization and training on efficient and effective logistics procedures in their organization, majority (87%) of the respondents stated that capacity building through training on customer care, engaging employees in departmental discussions on continuous improvement, team building and monetary rewards to boost employee's morale, as shown in Appendix VIII . These firms indicated that employees are usually trained in staff briefings, weekly and quarterly company trainings especially those in the customer care departments. On this issue a few (12.3%) affirmed that they did not engage in these employee sensitization and training on efficient programmes.

Further, the analysis in in Appendix VIII shows the measures firms had in place to ensure continuous and excellent services to the customers. Majority (90%) stating that training of employees on customers, customer relationship management, creation of customer care help desk and rewarding loyal customers and staff were the most dominant measures in place to ensure continuous and excellent services to customers. A few (10%) of these respondents highlighted other measures such as, establishment of feedback mechanisms and online social media customer engagement and Customer satisfaction surveys. When asked to give their opinions on whether their firms were well/highly equipped to fulfill customer needs, majority (92.7%) of the respondents opined that they had well trained and qualified staff in the areas of customer relationship management, well maintained machines and ICT support services. However a few (7.3%) did not respond to this question.

On whether the respondents would describe their firms as “innovation driven” in designing customer solutions to their logistics needs some (40%) of the respondents had no idea what that meant and therefore not quite sure whether they innovated customer solutions (Appendix VIII). However quite a considerable (60%) portion of the respondents indicated that their firms always sensitized and trained staff on customer traits, handling of difficult customers, investment in superior information systems and use of customer

feedback to improve services. All these issues were viewed by these third party port-centric logistics firms as innovations around the customer.

The findings agrees with Yu Tian et al. (2010) on third-party logistics provider customer orientation and customer firm logistics improvement in China that in services, logistics included, there must be elaborate systems and processes for customer recruitment and retention. In order to guarantee top notch customer care through customer help desks, organization must be agile as they continue training employees on new ways of engaging and exciting customers for continuous improvement (Thai, 2008). All firms in services that are customer-centric must not only be outward look as far as customer needs are concerned, but also be concerned with activities internally that empower the employees to face the customers with superior encounter. Third party port-centric logistics firms must build internal capacity to ensure agile customer care and continuously and innovatively introduce and implement customer care programmes that not only satisfy but excite customers.

Representing customer helpdesk sub-constructs were frequency of customer complaints and poor service due to poor customer service. In order to determine how third party port-centric logistics firms in Kenya practiced lean customer orientation management, the respondents were asked to indicate in a Likert scale the mean monthly frequency of occurrence of customer orientation management issues in the last one year of logistics operations, as shown in Appendix IX. When asked of the mean monthly frequency of customer complaints in their firms in the last one year of logistics operations, majority (76.4%) of the respondents affirmed that they had 1-5 customer complaints whereas a few (15%) affirmed that they did not have any customer complaints for the past year of their operations. Another group (6.3%) of the respondents affirmed that they had received 6-10 customer complaints while only (1.8%) had received customer complaints 11-20 times in the past one year of their operations. On the frequency these complaints were lodged, a majority (87.7%) of the respondents affirmed that they rarely got any customer complaints with a further 8.2% indicating that they had never received any customer complaints.

However, 4.1% of the respondents stated they sometimes received customer complaints while a meager (1.6%) number of the respondents stating they often received customer complaints.

When asked to state how often their firms experienced poor services due to lack of formal training of employees on customer care, majority (75.4%) of the respondents affirmed that it only happened 1-5 times on average in the last one year of operations while a smaller number (6.6%) of these firms indicated the issue recurring 6-10 times, as shown in Appendix IX. A good number (18%) of the firms indicated they never experienced poor services due to lack of formal training of employees on customer care while 1.6% of the respondents did not respond to this question. When requested to state the frequency of poor services due to lack of formal training of employees on customer care, majority (87.7%) stated it 'rarely' occurred, followed by 'never' (8.2%) and lastly the affirmation by third-party port-centric logistics firms in Kenya that 'sometimes' (4.1%) experienced poor services due to lack of formal training of employees on customer care.

A good customer experience means that the individual's experience during all points of contact matches the individual's expectations. When customers complain or indeed compliment, it must be keenly noticed and use the information provided to boost services and not to be complacent. It is important to note that customer experience implies customer involvement at different levels – such as rational, emotional, sensorial, physical, and spiritual and therefore customer care personnel must be alert to hear or see what the customer is saying. Whenever customers are in contact with the firm, whether directly or indirectly, same service level must be guaranteed in terms of delivery and satisfaction (Meyer & Schwager, 2007). The findings of this study in terms of the frequency of customer complaints and the frequency of poor services due to lack of formal customer care training (at 76.4% and 75.4% respectively) and both registering 1-5 complaints on average, indicate that third party port-centric logistics firms are striving towards superior customer care offering.

On the mean monthly rate of service failure occasioned by poor internal employee sensitization, majority (46.6%) of the respondents affirmed that it was the cause 1-5 times, as shown in Appendix IX. An equally large number (31.4%) of the respondents stated that the rate of service failure occasioned by poor internal employee sensitization occurred only 6-10 times during the past one year of logistics operations, as presented in Appendix IX. The least (22%) asserted their firms have never had service failure occasioned by poor internal employee sensitization while 4.8% of the respondents did not respond to this question. On how often service failure was caused by poor internal employee sensitization in their firms, the highest was it was 'rarely' (73.4%), followed by 'never' (22.6%) and lastly 'sometimes' (4%).

On whether third-party port-centric logistics firms in Kenya had tendencies to ignore customer feedback for service improvement, majority (74.4%) of the respondents affirmed it happened (1-5) times whereas the least (6.6%) stated it occurred 6-10 times in the last one year (Appendix IX). The number of firms that never encountered this phenomenon was 19% while 1.6% of the respondents did not respond to this question. On how often customer feedback was ignored, majority (46.6%) indicated it happened 'rarely', followed by 'sometimes' (31.4%) and lastly 'never' were 22% of the respondents. The respondents were asked to state the mean number of instances management of third-party port-centric logistics firms in Kenya ignored team building opportunities for customer care improvement as shown in Appendix IX. Results show that it happened 1-5 times in 48.6% of the firms, 6-10 times in 31.4% of the firms and zero (0) times in 20% of the firms. Non-response for this question was 4.8% of the respondents. On how often third-party port-centric logistics firms engaged in team building to boost team work, majority (73.4%) affirmed was a rare issue, followed by those that stated it has never occurred in their firms(22.6%) and a distant third are the firms that indicated it sometimes occurred (4%).

Thai (2008) in a study on Service quality in maritime transport and Lee and Peccei (2008) in a study on lean production and quality commitment agree lean management must not only take care of wastage but indeed other related services that boost customer perception



through customer care programmes. The importance of customer satisfaction is also echoed by Beverland and Lindgreen, (2006) who conducted a study on corporate culture, customer orientation, and innovativeness in Japanese firms and implementing market orientation in industrial firms respectively. From the data analysis and presentation on customer orientation by third party port-centric logistics firms in Kenya show a fairly low frequency of; customer complaints, service failure, ignoring customer feedback, poor services due to lack of training and management ignoring team building opportunities (76.4%, 46.6%, 74.4%, 75.4% and 48.6%), all recording an average monthly frequency of 1-5 occurrences for the last one year of operation. These findings therefore support the presence of this practice as per expectation and as supported by the explored literature.

#### **4.7.4 Descriptive Analysis of Cost Management Practices of Third-Party Port-Centric Logistics Firms in Kenya**

The fourth objective of this study was to assess the relationship between cost management and operational performance of third-party port-centric logistics firms in Kenya. In order to attain this objective, cost management construct was further divided into three sub-factors, namely; was divided into three sub-constructs, which are; cost sensitivity, Investment in modern equipment and machines and task-process mapping. Third party port-centric logistics firms were requested to respond on their agreement or disagreement on various lean cost management issues as well as identifying logistic service interventions their respective firms had invested in the past in order to achieve cost advantage and improved operations. When asked to identify logistics service interventions their firms had invested in the past in order to achieve improved operations cost advantage as shown in table 4.21, majority (98.4%) stated it was equipment modernization, followed by introduction of quality systems (96.8%), employee Training and development (92.7%), introduction/improvement of customer helpdesk (91.9%), then by market expansion campaigns (90.3%) and lastly, hiring of quality staff (88.7%).

The findings on logistics service interventions and effort by logistics services providers in order to reduce cost resonates well with the findings with a number of literature. Studies on lean transformation in the pure service environment, performance drivers of third-party logistics providers in mainland China and on impact of lean strategy on operational performance of Thai manufacturing companies (Wang et al., 2010; Rahman, Laosirihongthong & Sohal, 2010) strongly identifies waste management, investment in technology and investment in a quality management system as critical. This strongly implies that port-centric logistics firms must continuously invest internally to incrementally spur cost savings while providing superior service offering to customers at competitive pricing.

**Table 4.21 Specific Logistics Services Interventions**

<b>Interventions</b>	<b>Freq (N=124)</b>	<b>% Score</b>	<b>Ranking</b>
Equipment modernization	122	98.4	1
Employee Training and development	115	92.7	3
Hiring of quality staff	110	88.7	6
Market expansion campaigns	112	90.3	5
Intro/improvement of customer helpdesk	114	91.9	4
Introduction of quality systems	120	96.8	2

The respondents were asked to state how they agreed on whether management of their firms ignored effort to ensure every member of the organization is sensitized on cost saving measures in order to improve the overall performance as shown in table 4.22. Majority (86.1%) of the respondents affirmed that rarely was such an effort, with a lesser (8.2%) number of respondents indicating that there has never been such effort. Only 4.1% of the respondents agreed that sometimes such as effort was witnessed in their firms with 1.6% stating there was such effort very often in their logistics firms. On whether the logistics function is under-funded in order to achieve efficient logistics infrastructure for

improved operational performance, majority (73.2%) of the respondents affirmed that it was rarely the case, with fewer (21.4%) of the respondents stating that their logistics function never been under-funded. Only 4% of the respondents affirmed of logistics function under-funding while a minute (1.6%) confirming it logistics function under-funding was an often scenario in their firms.

The findings linger well with those of studies by Browning and Heath (2009) on the effects of lean on production cost, Blanchard (2007) on lean green and low cost as well of that of McIvor (2001) on lean supply on design and cost reduction dimensions. All these studies highlights the importance of investing in efficient production processes to ensure cost savings while pursuing low cost operations strategy. Efficient production processes requires heavy investments in technology, production equipment, quality management system and training of production personnel in order to reduce errors and faults in the processes.

On the statement on that logistics firms did not invest regularly on modern equipment in order to support efficient logistics services and operations, majority (75.4%) stated that the rarely while a much less (18%) number of the respondents indicating that their firms never invested regularly in modern equipment perhaps an indication the either leased or sub contracted some of these services, as shown in table 4.22. Even a much lower (6.6%) number of respondents indicated that sometimes their firms did not invest in modern equipment to support efficient logistics services and operations while 1.6% of the respondents stating it often was the situation.

On whether the ICT infrastructure for third part port-centric logistics firms were slow and inefficient in helping the firm achieve an efficient logistics services, majority (74.2%) stated that it rarely was the situation implying a level of investment in ICT infrastructure while a lower (21%) number of respondents stating never experiencing the situation as shown in table 4.22. On this issue 4.8% of the respondents agreed this phenomena happened sometimes while none rated it often or very often. On task-personnel matching,

respondents were asked to rate the statement that shifts and task-personnel-equipment are not well customized to stem out tasks overlap and increase efficiency for better operations performance, as shown in table 4.22. Majority (72.4%) stated that contented that it was a rare occurrence followed by the respondents (25.2%) who stated in has never occurred in their firms with a few (2.4%) of the respondents indicating it sometimes was the situation in their firms.

Third party logistics services business is equipment intensive and any firm in this segment must have a considerable level of investment in logistics equipment. The study provides evidence which is also supported by other studies (Jinhui Wu, Zhang & Shroeder, 2010; Yu Tian, Ellinger & Chen, 2010) that logistics services firms must on a continuous basis be cost sensitive, invest in equipment and ICT infrastructure as well as match personnel to tasks and equipment available in order to increase logistics efficiency resulting in superior operational performance (Lee & Peccei, 2008).

Third party port-centric logistics firms in Kenya are in business just like any other firm, undoubtedly needs to improve and expand their fundamentals, but not at the expense their clients. They must invest in cargo handling equipment and in efficient operations processes to ensure customers are not inconvenienced or suffer additional cost such as demurrages. In a number of firms particularly that were samples in this study, particularly the smaller in size, there was a challenge in handling capacity in terms of equipment such as handling gears, cranes and heavy duty forklifts and to cater for the shortfall these firms relied on hiring. This can easily interfere with the operations affecting the cost of operations.

**Table 4.22 Descriptive Analysis for Cost Management**

<b>Statement</b>	<b>Very often</b>	<b>Often</b>	<b>Sometimes</b>	<b>Rarely</b>	<b>Never</b>
Management ignores cost saving measures sensitization	8.2	86.7	4.1	1.6	0.0
There is no regular investment in modern equipment	18.0	75.4	6.6	1.6	0.0
ICT infrastructure is slow and inefficient	21.0	74.2	4.8	0.0	0.0
Shifts and task-personnel-equipment not well customized	25.2	72.4	2.4	0.0	0.0
logistics function under-funded for logistics efficiency	21.4	73.2	4.0	1.6	0.0

#### **4.7.5 Descriptive Analysis of Regulation of Third-Party Port Centric Logistics**

##### **Firms in Kenya**

The fifth objective of this study was to evaluate how regulation moderate the relationship between lean practices and operational performance of third-party port-centric logistics firms in Kenya. In order to attain this, the respondents were asked to express their agreement or disagreement on various regulation issues and how they affect their operational performance. In order to capture these issues, regulation was divided into three sub-constructs, which are; Government regulation, Industry regulation and Internal regulation mechanism. Questions were constructed based on these constraints and the respondents requested to express their level of agreement on them. The findings for regulation are presented in table 4.23.

When asked whether tight government regulation and controls through statutory bodies such as KRA, KPA, KeBS, KEPHIs and others affect their operational performance of

their respective firms, as shown in table 4.23, majority (73.4%) of the respondents agreed with another 21% strongly agreeing, few (4%) remained neutral while 1.6% disagreed on the issue. On whether the tight controls and procedures by Kenya Ports Authority affect their firms' effort to achieve efficiency and greater operational performance, majority (84.5%) of the respondents agreed whereas a few (8.2%) strongly agreeing with a trifling number (4.1%) remaining neutral and a further 3.2% of the respondents expressing disagreeing with this statement. When asked whether the industry licensing through KIFWA and other regulators such as Kenya Transport Authority effect the operational performance of their businesses, majority (68.6%) of the respondents agreed with fewer (22.6%) strongly agreeing. Only a handful (4% and 4.8%) of the respondents remained neutral and disagreed on this issue respectively.

On whether the regulatory environment on third-party port-centric logistics firms in Kenya offers conducive environment for firms to thrive and perform their logistics activities better, majority (72.6%) of the respondents agreed while fewer (21%) of the respondents strongly agreeing with a paltry (4.8% and 1.6%) remaining neutral and disagreeing on the issue respectively. The expectation is normally that regulation is necessary to provide stable trading conditions and to develop levels of business trust, a standpoint a regulator takes (World Bank, 2002; Atherton et al., 2008). The findings of this study on the issue of regulation of third party port-centric logistics industry in Kenya, Djankov et al. (2002) posits that a market or industry regulation may not always result in welfare improvement due to information asymmetries that can contribute to imperfect regulation. The result of this terms of outputs and prices remain, a situation where the market or industry remains a 'second best' to those of a competitive market. These findings are also comparable with the position by experts that many times regulation burden may affect enterprise competitiveness and productivity (Akinboade & Kinfack, 2012).

In this study, many (>70%) of the third party port-centric logistics firms in generally affirmed that regulation in this industry affected their logistics services and had a negative effect on operational performance. The study agrees that a level of regulation are needed in the third party port-centric logistics firms in Kenya, a position taken by [Small Business Project (SBP), 2004] that calls for an appropriate regulatory environment that posters economic development and growth strategy. This kind of regulation ensures any country encourages a robust private sector development without gagging the operating environment.

**Table 4.23 Descriptive Analysis for Regulation**

Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Tight government regulation affect logistics performance	21.0	73.4	4.0	1.6	0
KRA control and procedures affects operational performance	8.2	84.5	4.1	3.2	0
Industry regulation and licensing by KIFWA/KTA affect operational performance	22.6	68.6	4.0	4.8	0
Regulatory environment affects firms' ability to thrive	21.0	72.6	4.8	1.6	0

#### **4.7.6 Descriptive Analysis of Operational Performance of Third-Party Port-Centric Logistics Firms in Kenya**

Operational performance was the dependent variable of this study. It was measured in terms of customer orders, deliveries as per customer requests, cost of logistic services

offered, overall output and productivity, customer satisfaction level, synchronization of changes in schedules and plans with change in customer requirements and turn around in logistics services. Third party port-centric logistics firms through the respondents were asked to express their agreement or disagreement on various operational performance issues their respective firms touching on the three sub-constructs. The results for this analysis of the responses on operational performance, the dependent variable in this study is shown in Appendix X.

To begin with, the respondents were asked to state the percentage change of customer orders in their firms for the past one year and majority (72.4%) affirmed change by 6-15 percent, followed by 1-5 percent (25.2%), then by the respondents (2.4%) who stated the change was between 16-30 percent. Only few (0.8%) did not respond to this statement. When asked how significant their customer orders change was, majority (71.5%), remained neutral followed by those who stated it was insignificant (26%), with 2.4% of the respondents contending that it was significant. On deliveries as per customer requests, majority (73.4%) of the respondents affirmed that there was 1-5 percentage change in last one year with few (22.6%) affirming 6-15% change with only 4% stating 6-15 percent change in deliveries as per customer requests. It is important to note that service performance concerns (some highlighted here) includes such as quality of the service, on-time delivery, and flexibility of the service and others must be geared towards customer satisfaction with eventual arrival at operational excellence boosting the fundamentals (Daugherty et al., 2009; Huo et al., 2008).

On the significance of change in deliveries as per customer requests, majority (71.8%) of the respondents stated it was insignificant while few (20.6%) affirming that it was highly insignificant. Only 4% of the respondents remained neutral while another 3.6% stated the change was significant. When asked on the percentage change in customer satisfaction levels in the last year of their logistics operations, majority (66.4%) of the respondents affirmed 6-15 percent change, followed by 1-5 percent change (28.6%). Only a few (4.2%) affirmed that they had 16-30percent change while 0.8% stating zero change. A few



respondents (4%) did not respond to this question. On the significance of change on customer satisfaction levels, majority (63.9%) were neutral with fewer (31.9%) confirming it was insignificant, with significant option (3.4%) coming third. Only 0.8% of the respondents affirmed that it was highly insignificant.

The findings here are vindicated by the results of a study on understanding drivers of performance in the 3PL industry in Hong Kong by Huo et al. (2008) which asserts that service performance is one of the key measures of operational performance of service based firms. As well, lean management is well recognized approach and a fantastic strategy towards improving business performance in terms of profitability, sales and customer satisfaction (Fullerton & Wempe, 2009). The need to achieve delivery speed while meeting customer order requests is paramount for success in any logistics services. When firms understand customer orders and process and deliver them fast enough to them, it ends up creating a customer centered services helping in reinforcing customer satisfaction. Through the evidence in these findings, third party port-centric logistics firms in Kenya are moving this direction however the challenges.

When asked about the positive percentage change in cost of logistics services offered for the last one year, majority (74.1%) of the respondents affirmed it was between 1-5% followed by 'zero (0) change' (16.7%) while a small number (5.6% and 3.6%) experienced change in cost of logistics services 6-15% and 16-30% respectively. On how significant this change was, majority (76.6%) stated that it was insignificant, with fewer (17.7%) agreeing it was highly insignificant while just a scanty (5.6%) number of respondents remained neutral. On synchronization of changes in schedules and plans with change in customer requirements in the last year of their logistics operations, majority (73.4%) of the respondents affirmed 1-5 percentage changes, 20.0% affirmed that they had no changes at all. A meagre (4% and 2.6%) number of respondents affirmed that they had 6-15% and 16-30% change respectively. On how significant this change was, majority (60.7%) stated 'neutral' with fewer (35.2%) affirming it was insignificant and 4.1% of the respondents affirming it was significant. On the overall percentage change in output and

productivity, majority (66.9%) stated it was between 6-15 percent, followed by 15-30 percentage change (21.0%) with 1-5% change in output and productivity being affirmed by 8.9% of the respondents.

The findings of this study on cost of logistics services and flexibility are supported by Wang et al., (2010). The study on understanding performance drivers of third-party logistics providers in mainland China posits that operational performance relates to a company's performance in serving customers in terms of quality, flexibility, on time delivery and that these aspects must be present and strong for a sound operationally performing firm. As well, a study by Dhandapani, Potter & Naim (2004) in a steel plant in India, found that the firm realized substantial cost reduction by the implementation of lean management.

Since this study consistently shows presence of lean management practices in third party port-centric logistics firms in Kenya, it is not unexpected that the findings in regard to cost and flexibility are also consistent. On overall output and productivity for the last year in their business, 67.5% of the respondents affirmed that they had between 6-15 percentage changes with another 21.1% contenting that they had between 1-5 percentage changes in overall output and productivity. 2.4% of the respondents affirmed that they had no change at all in their overall output and productivity whereas 8.9% affirmed that they had between 16-30 percentage changes. One (1) respondent did not respond to this question. When asked how significant their overall output and productivity was, majority (74%) affirmed that it remained neutral, 13% affirmed that it was insignificant, 9.8% affirmed that it was significant and 3.3% of the respondents affirmed that it was quite insignificant. However, 1 respondent did not respond to this question. This is well in synch with a study by Singh et al. (2010) which posits that firms that are practicing lean whether service or manufacturing have a strong and formidable tool for escalating operations performance in terms of delivery speed and productivity.

When asked about the percentage changes in turnaround time in their logistics services for the last year of their logistics operations, majority (75.06%) of the respondents affirmed that the changes were between 1-5% while fewer (17.7%) affirmed that they had no changes whatsoever. Only 5.6% affirmed that they had 6-15 percent change in their turnaround times while 1.6% stated it was between 16-30 percentage changes. When asked how significant their turnaround times were, 54.5% took a neutral stand, 42.3% affirmed that it was insignificant and 3.3% of the respondents affirmed that it was significant. 1 respondent did not respond to this question.

The findings of this are in synch with findings of several studies conducted by a number of authors. In a study on the impact of lean operations on the Chinese manufacturing performance Taj and Morosan (2011) found that by more effectively designing and scheduling the movement of robots, and by eliminating unnecessary processes, significant improvements in cycle times were obtained, and therefore throughput time. Firms implementing lean management requires that lean suppliers receive, on time, stable schedules so that materials and parts can be secured and delivered on time (inbound logistics) so that the firms can efficiently run production while in record time, flexibly and speedily address customer requests in the outbound logistics operations (Bhasin, 2011; Dhandapani, Potter & Naim, 2004). It is important to note that the efficiency of the upstream and downstream logistics operations is highly dependent on quality and throughput rate effectively determined by cycle time.

For lean management to succeed in boosting performance, logistics services quality translates into strategies aimed at shorter and more predictable order cycle times, as well as maintaining certain levels of in-stock availability and certain fill rates on customer orders (Rahman, 2006; Kannan & Tan, 2005; Choi & Rungtusanatham, 1999). The findings of this study shows that there is a level of effect on operational performance by third party port-centric logistics firms in Kenya through practicing of lean. It is important

to note that this isn't a full proof evidence, but largely an extract from these findings is that there evidence of a considerable improvements in productivity and cycle times in the past year of operations in many of these firms.

#### **4.8 Relating Independent Variables to Dependent Variable**

The analysis on the relationship between lean practices was conducted at two levels. In the first level of analysis, the study sought to find out the interactions between lean practices (quality management, waste management, customer orientation management and cost management) and operational performance. This was followed by regressing each individual lean practice sub-constructs in order to determine the micro effect of each on operational performance.

##### **4.8.1 Relating Lean Practices and Operational Performance**

This section presents the data on multiple regression analysis which was conducted to address objectives I to IV of this study. These objectives were to determine the relationship between quality management, waste management, customer orientation management and cost management on operational performance of third-party port-centric logistic firms in Kenya The multiple regression analysis was guide by the model presented in Equation 3.2. Where Y is the dependent variable representing operational performance,  $X_i$  ( $X_1$  to  $X_4$ ) depicts the independent variables and  $X_5$  representing the moderator.  $\beta_{01}$  is a constant factor, the value of the dependent variable before the independent variable  $X_i$  assumes any value, such as when  $X_i = 0$ ;  $\beta_1$  is the regression coefficient associated with quality management ( $X_1$ );  $\beta_2$  is the regression coefficient associated with waste management ( $X_2$ );  $\beta_3$  is the regression coefficient associated with customer orientation management ( $X_3$ );  $\beta_4$  is the regression coefficient associated with cost management  $X_4$ .  $\xi$  is the stochastic or random disturbance term which addresses the random error or all other minor inconsequential effects on the model and which have not been captured. Using the data that was collected for this study, multiple regression analysis was conducted and a regression matrix was obtained as shown in Table 4.24.

Table 4.24 indicates that there was 88.6 % positive variations in operational performance index due to changes in independent variables and 13.4% variation of the dependent variable due to other factors not in the model. This meant that the model was good enough and more than convincingly suitable for (less than the requisite threshold of about 60%-100% for a good fit) depicting a strong positive correlation ( $R=.941$ ) between lean practices and operational performance of the third-party port-centric logistics firms in Kenya. A study on the effect of relationship banking and entrepreneurial orientation on financial performance of manufacturing firms in Kenya produced the adjusted value of  $R^2$  of 0.212 indicating that the model only explained 21.2% of the variations in the dependent variable (Rotich & Wanjau, 2016) and was considered good enough due to many other factors outside the model that affected the relationship. In another study by Rahman, Laosirihongthong and Sohal, (2010) on the impact of lean strategy on operational performance done amongst Thai manufacturing companies, the adjusted value of  $R^2$  for SMEs was found to be 0.371 (37.1%) and 0.222 for Large Enterprises. The findings were considered excellent enough since there are myriad of other factors outside lean practices that affected operational performance. The findings of these studies resonated well with the findings of this study.

**Table 4.24 Model Summary for Relating Lean Practices and Operational Performance**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.941 <sup>a</sup>	.886	.882	.13394

a. Predictors: (Constant), Quality Management, Waste Management, Customer Orientation Management, Cost Management

Table 4.25 displays the results of Analysis of Variance (ANOVA). F-value demonstrates the usefulness of the overall regression model at a 5% level of significance. Since the p-values of the F test were less than alpha ( $p < 0.05$ ), it was concluded that there was a

statistically significant relationship between the independent and dependent variables used in the study. The results also indicate that the relationship accounts for more than dominant number of variations in operational performance of third party port-centric logistics firms, that is 16.420 (88.59 %) out of 18.537, the rest of the variations being accounted for by other factors external to the model (Residual) as indicated by the sum of the squares (Rahman, Laosirihongthong & Sohal, 2010). Residual (or error) represents unexplained (or residual) variation after fitting a regression model. It is the difference (or left over) between the observed value of the variable and the value suggested by the regression model.

**Table 4.25 Analysis of Variance (ANOVA) Results**

<b>Model</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
1	Regression	16.420	4	4.105	228.815	.000 <sup>b</sup>
	Residual	2.117	118	.018		
	Total	18.537	122			

a. Dependent Variable: Operational performance

b. Predictors: (Constant), Quality Management, Waste Management, Customer Orientation Management, Cost Management

Table 4.26 shows the numerical relationship between the predictor variables and the response (dependent) variable in equation 4.1. This model implies that when lean practices (QualityMgt, WasteMgt, CustomerOrientMgt, CostMgt respectively) independently increased by one unit, operational performance responded by an increase of 0.384, 0.171, 0.118 and 0.431 respectively.

$$\text{Operational Performance} = -0.426 + 0.384(\text{QualityMgt}) + 0.171(\text{WasteMgt}) + 0.118(\text{CustomerOrientMgt}) + 0.431(\text{CostMgt}) \text{ ----- Equation 4.1}$$

On the significance of each variable, the findings in table 4.26 indicates that in relating lean variables and operational performance, all the beta coefficients associated with lean

practices emerging statistically significant with p-values ranging from 0.001 to 0.030. The findings of this study are comparable to the results of the study by Chavez et al. (2013) on internal lean practices and operational performance with a perspective of industry clockspeed. The study variables had positive correlations and fostered a positive effect on the relationship between independent and dependent variables. Similar studies where the variables were positively correlated and produced positive beta coefficients are studies by Rotich and Wanjau (2016) and Rahman, Laosirihongthong and Sohal (2010).

**Table 4.26 Coefficients for the Model Relating Lean Practices and Operational Performance**

Model		Unstandardized		Standardized		t	Sig.
		Coefficients		Coefficients			
		B	Std. Error	Beta			
1	(Constant)	-.426	.194			-2.196	.030
	QualityMgt	.384	.068	.274		5.678	.000
	WasteMgt	.171	.028	.322		6.194	.000
	CustomerOrientMgt	.118	.029	.190		4.088	.000
	CostMgt	.431	.041	.405		10.609	.000

a. Dependent Variable: Operational performance

The correlation analysis, as shown in Table 4.27 revealed that all the lean practices variables were positively correlated to each other with a correlation value of 0.411 and above. As well, lean variables had a strong positive correlation with operational performance of between .697 and 0.849.

**Table 4.27 Significance of Correlation between Individual Study Variables**

	OpsPerf	QualityMgt	WasteMgt	CustOMgt	CostMgt
OpsPerf - Corr.	1.000	.706	.849	.720	.697
Sig. (1-tailed)	.	.000	.000	.000	.000

QualityMgt – Corr.	.706	1.000	.666	.695	.411
Sig. (1-tailed)	.000	.	.000	.000	.010
WasteMgt – Corr	.849	.666	1.000	.657	.541
Sig. (1-tailed)	.000	.000	.	.000	.000
CustOMgt – Corr.	.720	.695	.657	1.000	.515
Sig. (1-tailed)	.000	.000	.000	.	.000
CostMgt – Corr.	.697	.411	.541	.515	1.000
Sig. (1-tailed)	.000	.010	.000	.000	.

#### 4.8.2 Relating Lean Practices Sub-Constructs and Operational Performance

In order to determine the influence of lean practices sub-constructs on operational performance of third party port-centric logistics firms in Kenya, the sub-constructs of each lean practice were regressed against operational performance. The results of the four regressions for the four set of lean practices sub-constructs are discussed in this section. Quality management practice had a set of three sub-constructs namely; damages, equipment down time and demurrages. The study sought to find out the influence each had in operational management. The sub-constructs (treated in this case as independent variables) were regressed against the independent variable operational performance. Based on these sub-constructs the model was as follows:

$$\text{Operational Performance} = \beta_{qm0} + \beta_{qm1}(\text{Damages}) + \beta_{qm2}(\text{Equip.Downtime}) + \beta_{qm3}(\text{Demurrages}) \quad \text{-----Equation 4.2}$$

Table 4.28 displays the model summary which captured the strength of the sub-constructs relationship with the dependent variable. From this summary, there was a 26.9% positive changes in operational performance emanating from the three independent variables whereas 72.1% of the changes in the dependent variable are due to other factors outside the quality sub-constraints.



**Table 4.28 Model Summary for Quality Management Sub-Constructs**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.519 <sup>a</sup>	.269	.251	.33735

Predictors: (Constant), Damages, Equipment down time, Demurrages

The results in table 4.29 brings out the contribution of each of the sub-constructs to the overall operational performance of third party port-centric logistics firms in Kenya.

$$\text{Operational Performance} = 1.915 + 0.256(\text{Damages}) + 0.528(\text{Equip.Downtime}) - 0.183(\text{Demurrages}) \text{ ----- Equation 4.3}$$

This model equation and together with results in table 4.29 on the relationship between quality sub-constructs (damages, equipment down time and demurrages) and operational performance indicates that operational performance changes by 0.256, 0.528 and -0.183 in response to independent changes by one unit in damages, equipment downtime and demurrages quality sub-constructs respectively. This also indicates that amongst the three sub-constructs, equipment downtime has the greatest effect on operational performance (0.528), followed by damages (0.256) and close third is demurrages (-0.183) with an inverse effect to operational performance. All the estimations of the quality sub-constructs were statistically significant at  $p < 0.05$ .

The findings on analysis of quality sub-constructs syncs well with the findings of Bowersox et al. (1985) that detected performance boost after quality implementation in excess of eight times the cost after adhering to quality standards. In a study on quality management in logistics, described quality in logistics, and the respondents ranked on-time delivery at 82.7 per cent, total support of customer needs at 53.8 per cent, and consistency of order cycle 40.4 per cent as the most important quality factors which positively supports the findings of this study (Rahman, 2006).

**Table 4.29 Coefficients of Quality Management Sub-Constructs Model**

Model		Unstandardized		Standardized	t	Sig.
		Coefficients		Coefficients		
		B	Std. Error	Beta		
1	(Constant)	1.915	.227		8.427	.000
	QM_Damages	.256	.093	.289	2.763	.007
	QM_EquipDtime	.528	.111	.463	4.745	.000
	QM_Demurrages	-.183	.133	-.167	-1.376	.048

a. Dependent Variable: Operational Performance

Waste management as a lean practice had three constraints; frequency of handling, Equipment availability and personnel availability. By treating these waste management sub-constructs as the independent variables, regressed analysis was done against operational performance. The model that was as follows:

$$\text{Operational Performance} = \beta_{wm0} + \beta_{wm1} (\text{WM\_FreqHandling}) + \beta_{wm2} (\text{WM\_EqAvail}) + \beta_{wm3} (\text{WM\_PersAvail}) \quad \text{----- Equation 4.4}$$

Table 4.30 summarizes the model used in relating waste management sub-constructs to operational performance. From the regression analysis 19.2% of the changes in operational performance are generally attributed to the changes in the independent variables. However, this model cannot account for 80.8% of the changes in operational performance, most likely caused by model interactions with factors outside the quality sub-constraints.

**Table 4.30 Model Summary for Waste Management Sub-Constructs**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.438 <sup>a</sup>	.192	.172	.35478

a. Predictors: (Constant), WM\_HandFreq, WM\_EquipAvail, WM\_PerAvail

The results in table 4.31 brings out the contribution of each of the sub-constructs to the overall operational performance of third party port-centric logistics firms in Kenya.

$$\text{Operational Performance} = 2.449 + .385(\text{WM\_FreqHandling}) + .189(\text{WM\_EqAvail}) - .130(\text{WM\_PersAvail}) \quad \text{----- Equation 4.5}$$

The results in table 4.31 indicate that when frequency of handling, Equipment availability and personnel availability (waste management sub-constraints) changed by one unit, the corresponding changes on operational performance are 0.385, 0.189 and -0.130 respectively, with personnel availability sub-construct seemingly having a negative effect on operational performance. Frequency of handling (0.385) had the greatest influence on operational performance followed by equipment availability (0.189). All the three estimates were statistically significant with  $p < 0.05$ .

The findings of this study rhyme well with the findings from previous studies such as Motwani (2003) that posits that the core of lean is changing and improving business processes in order eliminate waste. To put it clearly lean has over all significant positive relationship with performance of firms by fostering implementation of preventive maintenance activities, reducing setup time, reducing inventory, waste reduction, continuous/one piece flow, and removing bottlenecks (Chavez et al., 2013; Rahman, Laosirihongthong & Sohal, 2010).

**Table 4.31 Coefficients of Waste Management Sub-Constructs Model**

Model		Unstandardized		Standardized		Sig.
		B	Std. Error	Beta	t	
1	(Constant)	2.449	.231		10.610	.000
	WM_FreqHandling	.385	.114	.304	3.366	.001
	WM_EqAvail	.189	.081	.229	2.319	.022
	WM_PersAvail	-.130	.068	-.173	-1.898	.046

a. Dependent Variable: Operational Performance

The third lean variable addressed in this study was customer orientation management which had three sub-constructs; customer helpdesk, wide customer care and customer feedback. These sub-constructs were treated as independent variables and regressed against operational performance as captured using Equation 4.6.

$$\text{Operational Performance} = \beta_{co0} + \beta_{co1} (\text{CO\_HelpDesk}) + \beta_{co2} (\text{CO\_Feedback}) + \beta_{co3} (\text{CO\_WideCustCare}) \quad \text{----- Equation 4.6}$$

Table 4.32 and table 4.33 presents the results of regression analysis for the customer orientation management sub-constructs on operational performance. The model indicates that only 17.6% of variations in operational performance could be accounted for by changes in the customer orientation management sub-constructs. Other influencing factors external to this model accounted for 81.4% on the operational performance.

**Table 4.32 Model Summary for Customer Orientation Management Sub-Constructs**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.419 <sup>a</sup>	.176	.155	.35835

a. Predictors: (Constant), CO\_HelpDesk, CO\_Feedback, CO\_WideCustCare

The results in table 4.33 can be summarized in the regression model that follows:

$$\text{Operational Performance} = 2.490 + 0.300(\text{CO\_HelpDesk}) + 0.551 (\text{CO\_Feedback}) - 0.435(\text{CO\_WideCustCare}) \text{ ----- Equation 4.7}$$

The study results in Table 4.33 indicate that when customer helpdesk, customer care, customer feedback changed by one unit, operational performance responded by increasing by 0.300, 0.551 and 0.435 respectively. However, when organization wide customer care effort increased by a unit, operational performance decreased by 0.435 units. Customer helpdesk and customer feedback mechanism and interventions had the greatest positive effect on operational performance. All the three estimates were statistically significant with  $p < 0.05$ .

The findings of this study supports the relationship between a firm's market-orientation and its own performance and between logistics service and performance respectively (Stank et al., 2003). Olson et al. (2005) articulates a standpoint that firms must understand the latent needs of customers, which ordinary customers may not be unaware of, or have difficulty articulating and seek to address them(Olson et al., 2005). This resonates well with the findings of this study.

**Table 4.33 Coefficients of Customer Orientation Management Sub-Constructs Model**

Model		Unstandardized		Standardized		t	Sig.
		Coefficients		Coefficients			
		B	Std. Error	Beta			
1	(Constant)	2.490	.184			13.534	.000
	CO_HelpDesk	.300	.134	.290		2.241	.027
	CO_Feedback	.551	.152	.726		3.623	.000
	CO_WideCustCare	-.435	.190	-.565		-2.293	.024

a. Dependent Variable: Operational Performance

Cost management was the last lean practice explored in this study. It comprised of cost sensitivity, task-process mapping, and modern equipment sub-constructs. Cost management sub-constructs were used as the independent variables and regression analysis executed with operational performance as the dependent variable using the model. The results of regression analysis of cost management sub-constructs against operational performance are displayed in Table 4.34. the model was able to explain only 25.1% of the changes in operational performance arising from the predictor variables (cost management sub-constructs). 74.9% of the changes were as a result of other factors not picked by the model.

**Table 4.34 Model Summary for Cost Management Sub-Constructs**

<b>Model</b>	<b>R</b>	<b>R Square</b>	<b>Adjusted R Square</b>	<b>Std. Error of the Estimate</b>
1	.501 <sup>a</sup>	.251	.231	.34372

a. Predictors: (Constant), CM\_CSensitive, CM\_TPMapping, CM\_ModernEq

Table 4.35 shows the results of the regression analysis of independent cost management sub-constructs on operational performance. The findings indicate that task-process mapping to ensure peak operational performance emerged top with a beta coefficient of 0.282 followed by investments in modern equipment contributing 0.259 on operational performance with every one unit variation. Coming last, was cost sensitivity measures in running operations contributing 0.145 to operational performance with every unit change. Table 4.35 was summarized using **Equation 4.8**.

$$\text{Operational Performance} = 1.725 + 0.145(\text{CM\_CSensitive}) + 0.282(\text{CM\_TPMapping}) + 0.259(\text{CM\_ModernEq}) \text{ ----- Equation 4.8}$$

The findings of this study are in agreement with the inferences that logistics services providers must continuously provide services with competitive pricing coupled with cost sensitivity, attaching strong capital investments in efficient handling equipment and systems and embracing technology as a critical process enabler (Lee & Peccei, 2008; Flint et al., 2005). As well, Womack and Jones (2003) conjectured that the rise of lean enterprises as an organizational formation has led to improvements and to a process wide approach to production that has drastically reduced costs and improved quality, boosting operational performance across a range of industries and countries. This position syncs well with the findings that these lean sub-constructs are strongly and significantly related to operational performance of third party port-centric logistics firms in Kenya, all with probability values <0.05 (Table 4.35).

**Table 4.35 Coefficients of Cost Management Sub-Constructs Model**

Model		Unstandardized		Standardized		t	Sig.
		Coefficients		Coefficients			
		B	Std. Error	Beta			
1	(Constant)	1.725	.265			6.510	.000
	CM_CSensitive	.145	.101	.126		1.437	.044
	CM_PMapping	.282	.067	.346		4.236	.000
	CM_ModernEq	.259	.094	.247		2.772	.006

a. Dependent Variable: Operational Performance

#### **4.9 Moderation Effect of Regulation on the Relationship between Independent and Dependent Variables**

Using Moderated Multiple Regression (MMR) analysis in this study, the moderating effect of the variable (interaction term) was analyzed by interpreting the  $R^2$  change in the models obtained from the model summaries, and by interpreting the regression coefficients for the interaction term obtained from the coefficients' tables. Sazali, Haslinda, Jegak & Raduan (2009) used MMR analysis in their study on Moderating Effects of MNCs' Size in the Relationship between Degree of Inter-Firm Technology Transfer and Local Firms' Performance, by analyzing the moderating effect of the variable (interaction term), by interpreting the R-square change as well as interpreting the regressions coefficients for the interaction term.



#### **4.9.1 Moderation Effect of Regulation on the Relationship between Quality Management and Operational Performance**

In order to assess whether regulation affected the relationship between quality management and operational performance, a moderated multiple regression analysis was conducted. Table 4.36 shows the results for moderating effect of regulation on the relationship between quality management and operational performance. Model 1 shows that  $R = .709$ ,  $R^2 = .502$  and  $[F(2, 120) = 60.582, p = .000]$ . The value of  $R^2$  indicates that 60.582% of the variance in the third-party port-centric logistics firms' performance can be accounted for by quality management scores and regulation and it is statistically significant. Model 2 in Table 4.36, shows the results after the interaction term (QM\*REG) was added into the model.

The inclusion of the interaction term resulted into an  $R^2$  change of .022,  $[F(1, 119) = 0.022, p = 0.022]$ , showing presence of moderating effect, in such levels that are statistically significant ( $p < .05$ ). To put it differently, the moderating effect of regulation gained 2.2% variance in the operational performance, above and beyond the variance by quality management and operational performance. In general, the amount of change in  $R^2$  is a measure of the increase in predictive power of a particular dependent variable or variables, given the dependent variable or variables already in the model (Stockburger, 2001). Thus regulation significantly moderates the relationship between quality management and operational performance.

**Table 4.36 Moderated Multiple Regression Model Summary for Quality Management**

Model	R	Adjusted R Square	Std. Error of the Estimate	Change Statistics					
				R Square Change	F Change	df1	df2	Sig.	F Change
1	.709 <sup>a</sup>	.502	.494	.27724	.502	60.582	2	120	.000
2	.724 <sup>b</sup>	.524	.512	.27229	.022	5.409	1	119	.022

a. Predictors: (Constant), Quality Management, Regulation

b. Predictors: (Constant), Quality Management, Regulation , QM\*REG

In Table 4.37, Model 1 indicates that Quality Management was statistically significant ( $p < 0.05$ ; Beta value = 0.965); Regulation was statistically insignificant ( $p > 0.05$ ). Equation 4.9 shows that for a 1-unit increase in Quality Management, Operational Performance is predicted to have a difference of 0.965, given that regulation is held constant. The regression coefficient associated with regulation implies that the difference in operational performance between third-party port-centric logistics firms with high regulation and those with low regulation is 0.43 given that quality management is held constant. Therefore:

$$\text{Operational Performance} = -.141 + 0.965(\text{Quality Management}) + 0.043(\text{Regulation})$$

----- Equation 4.9

Model 2 reveals the details of the inclusion of the interactive term. Quality management was found to be significant ( $p < 0.05$ , Beta value = 1.131). Regulation was found to be insignificant ( $p = 0.090 > 0.05$ , Beta value = 0.079), and the interaction term QM\*Reg was found to be significant ( $p = 0.022 < 0.05$ , Beta value = -0.053). Therefore substituting the coefficients we obtain Equation 4.10.

$$\text{Operational Performance} = -0.131 + 1.131(\text{Quality Management}) + 0.079(\text{Regulation}) - 0.053(\text{QM*REG}) \quad \text{----- Equation 4.10}$$

The result in Table 4.37 indicates that for a 1-point increase in the quality management, resulted in increase of 1.131 on operational performance by holding regulation constant. The interpretation of the regression coefficients for the interaction term is that there was a -0.053 difference between the slope of quality management and operational performance of third-party port-centric logistics firms with low regulation and those with high regulation. Based on the findings from this analysis the study concluded that there was a statistically significant moderating effect of regulation (R-Square change of 2.2% at p = 0.022) on the relationship between quality management and operational performance on the basis of analysis of R-square changes.

It is important to note that all logistics firms, whether being regulated by an external agent or otherwise must commit to the quality journey. This is because firms will always seek to produce quality products and services; first, to meet customer demands in terms of quality, and secondly; to be competitive on the basis of quality dimension in the market through quality offerings (Thai, 2008; Lee & Peccei, 2008). This a natural expectation when it comes to quality management and operational performance of port-centric logistics firms in Kenya whether regulated or otherwise.

**Table 4.37 Model Coefficients for Moderated Relationship between Quality Management and Regulation**

Model		Unstandardized		Standardized		
		Coefficients		Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.141	.286		.494	.622
	QM	.965	.094	.688	10.267	.000
	REG	.043	.044	.064	.959	.339
2	(Constant)	-.137	.306		-.448	.655
	QM	1.131	.117	.806	9.696	.000
	REG	.079	.046	.119	1.707	.090
	QM*REG	-.053	.023	-.206	-2.326	.022

a. Dependent Variable: Operational Performance

#### **4.9.2 Moderation Effect of Regulation on the Relationship between Waste Management and Operational Performance**

In order to assess whether regulation affected the relationship between waste management and operational performance, a moderated multiple regression analysis was carried out. Table 4.38 displays the results of this analysis. Model 1 in Table 4.38 shows that  $R = .858$ ,  $R^2 = .737$  and  $[F(2, 120) = 167.719, p = .0001]$ . The value of  $R^2$  indicates that 73.7% of the variance in the third-party port-centric logistics firms' performance can be accounted for by waste management and regulation. Table 4.38 as well displays Model 2 results showing the results after the interaction term (waste management \* regulation) was introduced into the model. The results indicate that the inclusion of the interaction term resulted into an  $R^2$  change of .012,  $[F(1, 119) = 5.505, p = 0.021]$ , showing a statistically significant moderating effect of the interaction term. To put it differently, the moderating effect of regulation gained 1.2% variance in the operational performance, above and beyond the variance by waste management and operational performance. To this end

therefore, regulation moderates the relationship between waste management and operational performance.

Many firms in all industries measure operational performance against standard or prescribed indicators of effectiveness, efficiency, and environmental responsibility such as cycle time, productivity, waste reduction and regulatory compliance amongst others (Narasimhan & Das, 2001). As well, true and rational productivity of firms must be measured against regulatory compliance amongst other measures. Waste (mudas) identified by TPS include overproduction, waiting, conveyance, over processing, excess inventory, movement, defects and unused employee (Liker & Meier, 2006).

**Table 4.38 Moderated Multiple Regression Model Summary for Waste Management**

Model	R	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
				R Square Change	F Change	df1	df2	Sig. F Change
1	.858 <sup>a</sup>	.737	.20174	.737	167.719	2	120	.000
2	.865 <sup>b</sup>	.748	.19806	.012	5.505	1	119	.021

a. Predictors: (Constant), Waste Management, Regulation

b. Predictors: (Constant), Waste Management, Regulation, WM\*Regulation

Model 1 in Table 4.39 indicates that waste management was statistically significant ( $p=0.007$ ; Beta value = 0.086); Regulation was also statistically significant ( $p = 0.000$ ; Beta value = 0.439). Equation 4.11 shows that for a 1-unit increase in waste management, operational Performance was predicted to have a change of 0.086, given that the regulation is held constant. The regression coefficient associated with regulation was 0.439 which capture the difference in operational performance between third-party port-centric logistics firms with high regulation and those with low regulation, given that waste

management is held constant. Substituting the values of the regression coefficients, Equation 4.11 was obtained.

$$\text{Operational Performance} = 1.477 + 0.086(\text{Waste Management}) + 0.439(\text{Regulation})$$

----- Equation 4.11

Model 2 in Table 4.39 reveals the details of the inclusion of the interactive term into the model. Waste Management was found to be statistically significant ( $p=0.001$ , Beta value=0.116). Regulation was found to be significant ( $p=0.000$ , Beta value=0.507), and WM\*Regulation was also found to be statistically significant ( $p=0.021$ , Beta value= -0.030). Therefore substituting the coefficients of Model 2, Equation 4.12 was obtained.

$$\text{Operational Performance} = 1.382 + 0.16(\text{Waste Management}) + 0.507(\text{Regulation}) - 0.030(\text{WM} * \text{Regulation})$$

-----Equation 4.12

The result for Table 4.37 indicates that for a 1-point increase in the Waste Management, the Operational Performance is predicted to have a difference by 0.329, given that Regulation are held constant. The interpretation of the regression coefficients for the interaction term is that there was a 0.01 difference between the slope of operational performance on waste management between third-party port-centric logistics firms with low regulation and those with high regulation. Results based on the results in Equation 4.12 led to the conclusion that there was a significant moderating effect of regulation.

**Table 4.39 Model Coefficients for Moderated Relationship between Waste Management and Operational Performance**

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.477	.105		14.086	.000
	WM	.086	.031	.129	2.731	.007
	REG	.439	.025	.829	17.484	.000
2	(Constant)	1.382	.111		12.470	.000
	WM	.116	.033	.175	3.469	.001
	REGS	.507	.038	.958	13.307	.000
	WM*REG	-.030	.013	-.179	-2.346	.021

a. Dependent Variable: Operational Performance

Considering the forms of wastes (Liker & Meier, 2006), third party port-centric logistics firms in Kenya are faced with the challenge of achieving efficiency in logistics services within the framework of regulation. For instance, reduction in waiting time to pick and drop cargo from/to the port, conveyance and handling from/to the port and other places as well as the movement of cargo within the logistics yards and along the transportation corridors happens under the watchful eye of the regulator. This this is the reason why the study findings indicate that regulation is a critical interaction factor operational performance of logistics firms in Kenya. This notwithstanding, third party port-centric logistics firms have been working hard and smartly so around these challenges in order to optimize operational performance.

### **4.9.3 Moderation Effect of Regulation on the Relationship between Customer Orientation and Operational Performance**

Table 4.40 shows that for Model 1,  $R = .728$ ,  $R^2 = .531$  and  $[F(2, 120) = 67.827, p = .000]$ . The value of  $R^2$  indicates that 53.1% of the variance in the third-party port-centric logistics firms' performance is explained by customer orientation scores and regulation. Model 2 shows the results after the interaction term (Customer Orientation \* Regulation) was included in the model. The inclusion of the interaction term resulted in  $R^2$  change of 0.018,  $[F(1, 119) = 4.721, p = 0.032]$ . The results show a presence of a statistically significant ( $p < 0.05$ ) moderating effect of regulation on the relationship between customer orientation management and operational performance.

The implication is that the moderating effect of Regulation explains 1.8% variance in the operational performance, above and beyond the variance by Customer Orientation and Regulation. The nature of logistics services is such that the clientele is varied and largely 'lack information and knowledge' on the industry particularly on port-centric logistics processes and procedures. This situation is aggravated further by the participation of multiple parties in the logistics cycle, key being the regulators. From this standpoint, logistics services often unanticipatedly go wrong because of external factors beyond 3PL firms' control. In many of these scenarios, customers take a position that the 3PL firms are inefficient and customer insensitive and lounge myriad of complaints of poor customer service. This is what the third party port-centric logistics firms were unfortunately admitting, that, our customers, most often than not were not so 'a happy lot'.



**Table 4.40 MMR Model Summary for Customer Orientation**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.728 <sup>a</sup>	.531	.523	.26927	.531	67.827	2	120	.000
2	.741 <sup>b</sup>	.549	.537	.26519	.018	4.721	1	119	.032

a. Predictors: (Constant), Customer Orientation, Regulation

b. Predictors: (Constant), Customer Orientation, Regulation, COM\*REG

Summary of regression coefficients associated with regulated relationship between customer orientation and operational performance are presented in Table 4.41. Customer orientation was found to be slightly statistically insignificant at  $p=.057$  whereas regulation was statistically significant at  $p=.000$ . Beta coefficient for customer orientation shows that the difference in firm performance between third-party port-centric logistics firms with high regulation and those with low regulation is 0.433, given that customer orientation is held constant. Therefore:

$$\text{Operational Performance} = 1.585 - 0.075(\text{Customer Orientation}) + 0.433(\text{Regulation}) \text{ ----- Equation 4.13}$$

Model 2 in Table 4.41 depicts the details of the inclusion of the interactive term (COM\*Regulation) in the model. Customer orientation was found to be significant ( $p = 0.015$ , Beta value = 0.111). Regulation was found to be significant ( $p=0.000$ , Beta value=0.530) whereas the interaction variable COM\*Regulation was also found to be statistically significant ( $p=0.032$ , Beta value = -.040). These multiple regression coefficients were used to generate Equation 4.14.

$$\text{Operational Performance} = 1.449 + 0.111 (\text{Customer Orientation}) + 0.530(\text{Regulation}) - 0.032 (\text{COM}*\text{Regulation}) \text{ ----- Equation 4.14}$$

These results (Table 4.41) indicate that for a 1-point increase in the Customer Orientation, the Operational Performance is predicted to increase by 0.111, given that regulation is held constant. The interpretation of the regression coefficients for the interaction term is that there was a 0.032 difference between the slope of customer orientation and operational performance of third-party port-centric logistics firms with low regulation and those with high regulation. Results based on the analysis in Table 4.40 and Table 4.41 led to the conclusion that there was a statistically significant moderating effect of regulation on the relationship between customer orientation management and operational performance of third party port-centric logistics firms in Kenya. Firms that understand the latent needs of customer needs of which ordinary customers are unaware, or have difficulty articulating often post positive results (Olson et al., 2005) and that firms must link its market-orientation and its own performance and between logistics service and performance (Hult & Ketchen, 2001; Stank et al., 2003).

**Table 4.41 Model Coefficients for Moderated Relationship between Orientation Management and Regulation**

Model		Unstandardized		Standardized		
		Coefficients		Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	1.585	.150		10.549	.000
	COM	.075	.042	.114	1.781	.057
	REG	.433	.040	.697	10.907	.000
2	(Constant)	1.449	.161		9.010	.000
	COM	.111	.045	.167	2.476	.015
	REG	.530	.059	.851	8.961	.000
	COM*REG	-.040	.019	-.219	-2.173	.032

a. Dependent Variable: Operational Performance

#### **4.9.4 Moderation Effect of Regulation on the Relationship between Cost Management and Operational Performance**

Table 4.42 shows that for Model 1,  $R = .737$ ,  $R^2 = .544$  and  $[F(2, 120) = 71.503, p = .000]$ . The value of  $R^2$  indicates that 54.4% of the variance in the third party port-centric logistics firms' operational performance was explained by cost management scores and regulation. Model 2 shows the results after the interaction term (Cost Management\*Regulation) was included in the model. It indicates that the inclusion of this interaction term resulted into an  $R^2$  change of 0.171,  $[F(1, 119) = 71.474, p = 0.000]$ . The results show a presence of statistically significant ( $p=0.000<0.05$ ) moderating effect of regulation on the relationship between cost management and operational performance. To put it differently, the moderating effect of regulation explains 17.1% variance in the operational performance, above and beyond the variance by cost management and regulation. It is no doubt that regulation is necessary to provide stable trading conditions and to help generate a level of

business trust and therefore a good thing in an organized business environment (World Bank, 2002; Atherton et al., 2008).

The rise of the lean enterprise has led to the improvements and a process wide approach to production that has drastically reduced costs and improved quality of goods and services across board (Womack & Jones, 2005). Indeed, in china where all industries are closely and tightly regulated, third-party logistics providers in mainland China maintained a reasonable service performance (Wang et al., 2010). The findings of this study indicate that regulation is a good thing in the relationship in moderating the relationship between cost management and operational performance of third party port-centric logistics firms in Kenya.

**Table 4.42 Moderated Multiple Regression Model Summary for Cost Management**

Mode	R	R <sup>2</sup>		SEE	Change Statistics				
		R <sup>2</sup>	Adj		R <sup>2</sup>	Change	F Change	df1	df2
1	.737 <sup>a</sup>	.544	.536	.26548	.544	71.503	2	120	.000
2	.846 <sup>b</sup>	.715	.708	.21072	.171	71.474	1	119	.000

a. Predictors: (Constant), Cost Management, Regulation

b. Predictors: (Constant), Cost Management, Regulation, CM\*REG

Table 4.43 shows the results of Model 1 that cost management was statistically significant ( $p = 0.000$ ; Beta value = .159); Regulation was also statistically significant ( $p = 0.000$ ). This led to the conclusion that for a 1-unit increase in cost management, operational performance of 3PL firms was predicted to increase by .159, by holding regulation constant. The regression coefficient associated with regulation in Model 1 implies that the difference in firm performance between third-party port-centric logistics firms with high regulation and those with low regulation is 0.737, given that cost management is held

constant. Using these regression coefficients the mathematical model represented by Equation 4.15 was generated.

$$\text{Operational Performance} = 0.516 + 159(\text{Cost Management}) + 0.737(\text{Regulation})$$

----- Equation 4.15

Model 2 in Table 4.43 reveals the details of the inclusion of the interaction term in the model. Cost Management was found to be statistically insignificant (p=0.512, Beta value = .024). Regulation was found to be significant (p=0.000, Beta value = 0.673). On introduction of interaction term, CM\*Regulation was found to be statistically significant at p=0.000 with a Beta value of 0.164. With the introduction of the moderation term, new regression coefficients were generated and a mathematical regression model generated as represented by Equation 4.16.

$$\text{Operational Performance} = -0.28 + 0.024(\text{Cost Management}) + 0.673(\text{Regulation}) + 0.164(\text{CM*Regulation})$$

-----Equation 4.16

The result in Table 4.43 for Model 2 indicate that for a 1-point increase in the Cost Management, the Operational Performance is predicted to increase by 0.024, given that regulation was held constant. The interpretation of the regression coefficients for the interaction term is that there was a 0.164 difference between the slope of operational performance and cost management between third-party port-centric logistics firms with low regulation and those with high regulation. Results based on Equation 4.16 led to the conclusion that there was a statistically significant moderating effect of regulation on the relationship between cost management and operational performance of third party port-centric logistics firms in Kenya.

**Table 4.43 Moderated Multiple Regression Model Coefficients for Cost Management**

Model		Unstandardized		Standardize	t	Sig.
		Coefficients		d		
		B	Std. Error	Beta		
1	(Constant)	.516	.232		2.225	.028
	CM	.159	.041	.241	3.910	.000
	REG	.737	.066	.692	11.218	.000
2	(Constant)	-.028	.195		-.141	.888
	CM	.024	.036	.036	.658	.512
	REG	.673	.053	.632	12.775	.000
	CM*REG	.164	.019	.466	8.454	.000

a. Dependent Variable: Operational Performance

#### **4.9.5 Overall Moderation Effect on the Relationship between Lean Practices and Operational Performance**

In order to assess the overall effect of regulation on the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya, the moderated multiple regression model was considered. Table 4.44 shows the results of the moderation effect of regulation on the relationship between lean practices (quality management, waste management, customer orientation and cost management) and operational performance. Model 1 in Table 4.44 shows that  $R = .941$ ,  $R^2 = .886$  and  $[F(4, 118) = 228.815, p = .000]$ .  $R^2$  value indicate that 88.6% of the variance in the third-party port-centric logistics firms' operational performance can be accounted for by the independent variables (lean practices) considered in this study.

Model 2 in Table 4.44, displays the results after the introduction of the overall interaction term (lean practices \* regulation) in the model. The results indicate that the inclusion of the interaction term resulted into an R<sup>2</sup> change of .016, [F (1, 117) = 19.206, p =.000], showing presence of a statistically significant moderation effect. To put it clearly, the moderating effect of regulations gained 1.6% variance above and beyond the variance by the lean practices (combined) and operational performance. This implies that a statistically significant regulation moderated the relationship between lean practices and operational performance of thirds party port-centric logistics firms in Kenya.

**Table 4.44 Overall Moderated Multiple Regression Model Summary**

Mode	R <sup>2</sup>				Change Statistics				
	1	R	R <sup>2</sup>	Adj	SEE	R <sup>2</sup> Change	F Change	df1	df2
1	.941 <sup>a</sup>	.886	.882	.13394	.886	228.815	4	118	.000
2	.950 <sup>b</sup>	.902	.898	.12467	.016	19.206	1	117	.000

a. Predictors: (Constant), CostMgt, WasteMgt, CustomerOrient, QualityMgt

b. Predictors: (Constant), CostMgt, WasteMgt, CustomerOrient, QualityMgt, (Xi\*Reg)Comb.

Model 1 in Table 4.45 captures the results of multiple regression analysis before introducing the interaction term in the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya. All the lean practices (quality management, waste management, customer orientation management and cost management) were found to be statistically significant with all having a p-value of 0.000<0.05 and Beta values of 0.384, 0.171, 0.118 and 0.431 respectively. Quality management was statistically significant at p=0.000 and beta value of 0.384as well as waste management at p=0.000 and beta value of 0.171. As well, customer orientation test was statistically significant at p= 0.000 with beta value of 0.118. The results for cost management indicated statistical significance with p=0.000 and a beta value of 0.431.

After introducing the interaction term (Xi\*Reg)Comb, all the lean variables remained statistically significant (p=0.000, p=0.001, p=0.008, p=0.000 for quality management, waste management, customer orientation management and cost management respectively) with beta values of 0.328, 0.106, 0.076 and 0.548 respectively. The interaction term was also statistically significant at p=0.000 with beta value of 0.013. Substituting the coefficients in Table 4.45, Equation 4.17 was obtained.

$$\text{Operational Performance} = -0.585 + 0.328(\text{QualityMgt}) + 0.106(\text{WasteMgt}) + 0.076(\text{CustomerOrient}) + 0.548(\text{CostMgt}) + 0.013(\text{Xi*Reg)Comb} -$$

----- **Equation 4.17**

Equation 4.17 shows that each predictor variables (quality management, waste management, customer orientation management, cost management and (Xi\*Reg)Comb) contributed to changes in operational performance by 0.328, 0.106, 0.076, 0.548 and 0.013 respectively. The regression coefficients associated with moderation effect in the model implies that the difference in operational performance between third-party port-centric logistics firms with high regulation and those firms with low regulation is 0.013 as depicted by (Xi\*Reg)Comb interaction coefficient in Model 2 presented in Table 4.45.



**Table 4.45 Overall Model Coefficients for Moderated Relationship between Lean Practices and Operational Performance**

Model	Unstandardized		Standardized	t	Sig.	
	Coefficients		Coefficients			
	B	Std. Error	Beta			
1	(Constant)	-.426	.194		-2.196	.030
	QualityMgt	.384	.068	.274	5.678	.000
	WasteMgt	.171	.028	.322	6.194	.000
	CustomerOrien t	.118	.029	.190	4.088	.000
	CostMgt	.431	.041	.405	10.609	.000
2	(Constant)	-.585	.184		-3.176	.002
	Quality Mgt	.328	.064	.234	5.097	.000
	Waste Mgt	.106	.030	.200	3.566	.001
	CustomerOrien t	.076	.029	.123	2.677	.008
	CostMgt	.548	.046	.515	11.836	.000
	(Xi*Reg)Comb	.013	.003	.222	4.383	.000

a. Dependent Variable: OpsPerf

Table 4.46 shows the ANOVA results before and after the introduction of the interaction term. Model 2 indicates that after introducing moderation the moderation term (Xi\*Reg)Comb in the model, the value of F (215.136) is still significant at 0.05 significant level (p=0.000). This value is relatively high enough (compared to value of F = 228.815 before the introduction of moderation) to conclude that Quality management (QM), Waste management (WM), Customer Orientation Management (COM) and Cost Management (CM)) are critical factors in determining the relationship between lean practices and

operational performance of third party port-centric logistics firms in Kenya even with the presence of moderation (regulation).

The findings of this study resonates well with the results of a study by Chavez et al. (2013) which was on internal lean practices and operational performance. The study found that the industry clockspeed was significantly moderating the relationship between lean practices and operational performance. In a study on impact of lean strategy on operational performance in Thai manufacturing companies, the results indicated that three lean constructs (JIT, waste minimization and flow management) were all significantly related to operational performance and therefore the associated null hypothesis consequently rejected (Rahman, Laosirihongthong & Sohal, 2010). A study by Rotich and Wanjau (2016) rejected all the null hypotheses of the study, findings evidencing that there was a significant effect of relationship banking (relationship lending, relationship monitoring, bundle of products and risk sharing) and financial performance of manufacturing firms in Kenya.

**Table 4.46 Analysis of Variance (ANOVA) Results**

<b>Model</b>		<b>Sum of Squares</b>	<b>df</b>	<b>Mean Square</b>	<b>F</b>	<b>Sig.</b>
1	Regression	16.420	4	4.105	228.815	.000b
	Residual	2.117	118	.018		
	Total	18.537	122			
2	Regression	16.718	5	3.344	215.136	.000c
	Residual	1.818	117	.016		
	Total	18.537	122			

a. Dependent Variable: OpsPerf

b. Predictors: (Constant), QualityMgt, WasteMgt, CustomerOrient, CostMgt

c. Predictors: (Constant), QualityMgt, WasteMgt, CustomerOrient, CostMgt, (Xi\*Reg)Comb

#### **4.9.6 Test of Hypotheses**

This study was guided by a set of five hypotheses which were used as a guide towards successful realization of this research. The relationship between each of the four lean variables (quality management, waste management, customer orientation management and cost management) and operational performance of third-party port-centric logistics firms in Kenya was hypothesized each represented by a hypothetical statement that was tested. Finally the moderation effect on the relationship between the lean variables was hypothesized capturing the fifth hypothesis. Table 4.47 shows the summary of the statistics for the hypotheses testing. When reading this table we are interested much in the results or values of the Chi-square, F test and student (t) test. On the basis of the computed Chi-square values, the null hypotheses are rejected when the value of Probability ( $p=0.05$ ) > the computed value of the Chi-square (Park, 2008).

Table 4.47 shows that all the computed Chi-square values significant (3233.533, 5016.806, 4549.770, 4692.621 and 5541.492) are much higher than the hypothesized probability value of  $p=0.05$ . All these tests are statistically significant with p-values of (.000, .001, .000 and .000) leading to the conclusion that we reject the null hypotheses  $H_{01}$ ,  $H_{02}$ ,  $H_{03}$ ,  $H_{03}$ ,  $H_{04}$  and  $H_{05}$ . This study concluded that there was a significant relationship between all the independent variables (Quality Management, Waste Management, Customer Orientation management and Cost Management) and operational performance of third-party port-centric logistics firms in Kenya and that this relationship is significantly (statistically) moderated by regulation. This consequently meant rejection of the assertion of non-statistical significant relationship between lean practices and operational performance. Brook (2010) used Chi-square test to discover if there was relationship between categorical variables, in a book, Lean Six Sigma and minitab: The Complete Tool Box guide for all Lean Six sigma Practitioners.

**Table 4.47 Hypotheses Testing Results**

<b>Hypotheses</b>	<b>t-Test</b>	<b>F - test</b>	<b>X<sup>2</sup>-Test</b>	<b>Prob.</b>	<b>Conclusion</b>
<b>H<sub>01</sub>:</b> There is no significant difference in the relationship between quality management and operational performance of third party port-centric logistics firms in Kenya.	10.969	120.323	3233.533	.000	Reject H <sub>01</sub>
<b>H<sub>02</sub>:</b> There is no significant difference in the relationship between waste management and operational performance of third-party port-centric logistic firms in Kenya.	17.645	311.355	5016.806	.001	Reject H <sub>02</sub>
<b>H<sub>03</sub>:</b> There is no significant difference in the relationship between customer orientation and operational performance of third-party port-centric logistic firms in Kenya.	11.408	130.143	4549.770	.000	Reject H <sub>03</sub>
<b>H<sub>04</sub>:</b> There is no significant difference in the relationship between cost management and operational performance of third-party port-centric logistic firms in Kenya.	10.688	114.228	4692.621	.000	Reject H <sub>04</sub>
<b>H<sub>05</sub>:</b> There is no significant effect of regulation as a moderating variable on the relationship between lean practices and operational performance of third-party port-centric logistic firms in Kenya.	4.383	215.136	5541.492	.000	Reject H <sub>05</sub>

## CHAPTER FIVE

### SUMMARY, CONCLUSION AND RECOMMENDATIONS

#### 5.1 Introduction

The summary of the study are presented in this chapter as guided by the specific objectives. This is followed by conclusions seeking to draw meaning from the study as well recommendations based on the major finds as drawn from data analysed and presented. The chapter finally gives direction on areas of focus to researcher based on the exposure, scope and challenges unfolded by this study.

#### 5.2 Summary of Findings

This study reconnoitered and anchored on both theoretical and empirical studies on lean practices, lean management and therefore on this standpoint, a conceptual model that helped in realizing this study was developed. Further, the hypothesized relationships based on the relationship of independent and dependent variables were tested and conclusions made thereof. In order to conduct successful empirical test, several assumptions of the study variables were tested and which were positive thereby supporting the credibility, applicability and generalizability of this study. These tests were; normality tests, multicollinearity, heteroscedasticity test, linearity, outliers, and sampling adequacy test.

With a response rate of 75.6%, and with many firms (Table 4.5) stating they were in third party port-centric logistics business the study was largely successful. In order to achieve the general objective of this study, the summary of the analysis based on the five specific objectives of this study are meticulously presented below. The summary of the coefficients for the model relating lean practices and operational performance (Table 4.26) indicate that logistics firms that did not practice lean at all were completely disadvantaged with the regression constant-value ( $\beta_0$ ) of -.426 at  $p=0.030$ .

##### 5.2.1 Relationship between Quality Management and Operational Performance

On the relationship between quality management and operational performance, this study found out that the two variables had a strong positive association. This implication is that third party port-centric logistics firms have largely implemented

lean quality and realized a marginal improvement in operational performance ( $\beta_1 = .384$ ). The null hypothesis ( $H_{01}$ ) was rejected at  $p=0.000$  with evidence that there was statistically significant difference in the relationship between quality management and operational performance of third party port-centric logistic firms in Kenya. This is an acknowledgement that, one of the most critical embrace for an operations' oriented firm is implementation of quality programmes such as QMS. This will always and ultimately tilt performance in a positive way.

The findings of this study are in consistency with the findings of a study done Rahman (2006) on quality management in logistics, examined industry practices and observed that managers described quality in logistics, and the respondents ranked on-time delivery, which is one of the quality issues in this study at 82.7 per cent, total support of customer needs at 53.8 per cent, and consistency of order cycle 40.4 per cent as the most important quality factors which positively supports the findings of this study. There is evidence to suggest that improving the quality of all logistics operations and supply chain stages results in reduced costs, improved resource utilization, and improved system efficiency, this is according to a in process quality model for the analysis, improvement and control of supply chain systems (Beamon & Ware, 1998).

On the effect of regulation on the relationship between quality and operational performance of third party port-centric logistics firms in Kenya an  $R^2$  change of .022, [ $F(1, 119) = 0.022, p = 0.022$ ] was observed, showing presence of moderation effect, in such levels that are statistically significant ( $p < .05$ ). This implied that regulation gained 2.2% variance in the operational performance. There are arguments for appropriate regulatory environment as they the single most important element in an economic growth strategy which is essential for robust private sector development [Small Business Project (SBP), 2004]; others are in doubt on whether really regulation help in the growth of entrepreneurial spirit (Djankov et al., 2002). Based on the standpoint presented by these studies, the results of the moderation effect of regulation on the relationship between quality and operational performance stands vindicated.

### **5.2.2 Relationship between Waste Management and Operational Performance**

The study found out that there was a statistically significant relationship between waste management and operational performance of third party port-centric logistics firms in Kenya. The null hypothesis ( $H_{02}$ ) that there is no significant difference in the relationship between waste management and operational performance of third party port-centric logistic firms in Kenya was therefore rejected ( $\beta_2=.171$ ,  $p=0.000$ ). When 3PL firms' efforts are towards waste elimination such as in transportation; motion; waiting; over-processing and defects, the performance (operational performance) of these firms improve as well. The avoidance of wastages in a logistics firms also help in the preservation of these resources and which can be mobilized and channeled for more useful applications thereby impacting performance even more. It is therefore a reality that doing nothing about wastage in a firm is the greatest evidence of poor performance whose consequence is in the offing.

On whether this particular finding is supported by literature, several studies vindicates the results of this study in regards to the relationship between waste management and operational performance. Waste reduction is an effective way to increase a firm performance. Lean requires keeping far less than half the needed inventory leading to fewer defects, and produces a greater variety of products and performance (Papadopoulou & Özbayrak, 2005). Lean must also produce top quality products and services and be both efficient and economical while optimising productivity by eliminating waste in all areas of operations (Bhasin, 2011). On the moderating effect of regulation on the relationship between waste management and operational performance of third party port-centric logistics firms in Kenya, the findings of this study revealed  $R^2$  change of .012, [ $F(1, 119) = 5.505$ ,  $p = 0.021$ ], showing a statistically significant moderating effect of the interaction term.

### **5.2.3 Relationship between Customer Orientation and Operational Performance**

In regard to the relationship between customer orientation and operational performance of third party port-centric logistics firms in Kenya, the study found out that customer orientation and operational performance were statistically significantly related to each other. The null hypothesis ( $H_{03}$ ) that there is no significant difference

in the relationship between customer orientation and operational performance of third party port-centric logistic firms in Kenya was rejected ( $\beta_2=.118$  at  $p=0.000$ ). The implication is that by 3PL being customer or market oriented or focused, it contributed in a positive way to operational performance and vice versa. However in the open ended responses, there was a lot of doubt on whether this relationship was so, with an inverse trend. This inverse responses can be explained on the basis of lack of information and knowledge on the side of the customers in regard to port-centric logistics business, particularly on the multi-agency involvement in the business.

It is also critical that the logistics service providers which are a critical component of any supply chain of an organization, require to put in place systems that improve on customer service experience and intimacy. This has been shown through a study by studies on customer orientated which show a strong link with the success of firms' innovative efforts (Mavondo & Farrell, 2003). The findings of the study further reinforces the position that customer orientation of firms matter and the evidence of influence of customer orientation on operational performance vindicates this standpoint that firms must understand the latent needs of customers, which ordinary customers may not be unaware, or have difficulty articulating (Olson et al., 2005).

On the moderating effect of regulation on the relationship between customer orientation and operational performance of third party port-centric logistics firms in Kenya, the study revealed  $R^2$  change of 0.018, [ $F(1, 119) = 4.721, p = 0.032$ ]. This indicates that regulation had a statistically significant ( $p < 0.05$ ) moderation effect. As 3PL firms continuously seek to satisfy and excite their customers, it can only happen within the confines of the regulation framework.

#### **5.2.4 Relationship between Cost Management and Operational Performance**

The study revealed that cost management is related to operational performance of third party port-centric logistic firms in Kenya. The findings showed that these firms implemented cost management interventions curbing operations based costs and realized improvements in operational performance ( $\beta_4 = .431$ ). The null hypothesis ( $H_{04}$ ) was rejected at  $p=0.000$  with evidence that there was statistically significant



difference in the relationship between cost management and operational performance of third party port-centric logistic firms in Kenya.

This findings that cost management influences operational performance of third party port-centric logistic firms in Kenya comparable well with the research by Womack and Jones (2003) that lean enterprise as an organizational formation has led to improvements and a process wide approach to production that has drastically reduced costs and improved quality and boosting operational performance. A study done in China on understanding performance drivers of third-party logistics providers in mainland China explained that the third party providers in China and in underdeveloped 3PL industries (like in the Kenyan situation) maintained a reasonable service performance (Wang et al., 2010).

On the moderating effect of regulation on the relationship between cost management and operational performance of third party port-centric logistics firms in Kenya, the findings indicate that the inclusion of this interaction term resulted into a statistically significant  $R^2$  change of 0.171, [ $F(1, 119) = 71.474, p = 0.000$ ]. This revealed that the moderating effect of regulation explained 17.1% variance in the operational performance, above and beyond the variance by cost management and regulation. Regulation is important for any organized economy (Small Business Project, 2004) but it must always be implemented with caution since it can kill the entrepreneurial and innovativeness of businesses (Djankov et al., 2002).

#### **5.2.5 Overall Model of the Relationship between Lean Practices and Operational Performance**

The study found out that the strength of the relationship between lean practices and operational performance was a strong and statistically significant one. The F-value demonstrating the usefulness of the overall model at a 5% level of significance with alpha-value ( $p < 0.05$ ), it was concluded that there was a statistically significant relationship between the independent and dependent variables used in the study, that lean practices and operational performance are significantly associated. This reality was further reinforced by the correlation coefficient which shows the extent of operational performance of third party port-centric logistics firms that can be attributed

to the changes in the lean practices. The study hypotheses (H<sub>02</sub>-H<sub>04</sub>) were not supported by the results of analysis in this study. Therefore the hypothesis that there is no significant difference in the relationship between lean practices (quality management, waste management, customer orientation and cost management) and operational performance were rejected.

On the effect of regulation on the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya an R<sup>2</sup> change of .016, [F (1, 117) = 19.206, p = .000]. the results revealed a statistically significant moderation effect on the relationship between lean practices and operational performance of third party port-centric logistics firms in Kenya. This implies that the moderation effect of regulations gained 1.6% variance above and beyond the variance by the lean practices (combined) and operational performance. The rejection of the null hypothesis (H<sub>05</sub>) of this study resonated well with the findings of a similar study (Chavez et al., 2013) which was on internal lean practices and operational performance. The study found that the industry clock-speed significantly moderated the relationship between lean practices and operational performance.

### **5.3 Conclusions of the Study**

This implies that 3PL firms that implemented quality practice mostly through QMS had better operational performance as evidenced from the findings. Any logistics service provider must institutionalize quality practice as informed by the institutional theory of management. Through organizational mechanisms 3PL firms will be able to create a common set of quality values, norms and rules that support quality practice and boost performance. The greatest impact of embracing quality management, is the overall contribution of 3PL firms to the effectiveness of supply chains, positively affecting the micro and macro economics.

There was a clear indication that 3PL firms had interventions on waste reduction that worked in helping their logistics businesses achieve better operational performance. This is in synch with the Resource Based View (RBV) which underpins the need for firms to accumulate resources and capabilities that are rare and valuable. In the journey of continuous improvement, these firms should use the released resources to gain

further competitive advantage by investing in modern equipment and machines and training operations employees for peak performance. Furthermore, by so doing, 3PL firms helps in dealing with wastage along the supply chains which if unaddressed ends up affecting the prices of products and services.

However, there was mixed reaction from 3PL firms whether customer focusing programmes were working due to external interruptions of their services from the regulators. The findings of this study reverberates well with the customer value theory that depicts leading-edge logistics service providers as being centrally focused on the needs of customers and highly equipped to fulfill customer needs (Beverland & Lindgreen, 2006). The presence of an efficient and effective supply chain management will always address the supplier vendor relationships in upstream and downstream supply chains. This results in effective inbound and outbound logistics culminating in improved operational performance. Clearly the findings of this study indicts 3PL firms by requiring them to do more on customer focus and satisfaction.

In regard to the relationship between cost management and operational performance of third party port-centric logistics firms, the analysis revealed that there was a positive, statistically significant relationship between the two variables. Dealing with cost in order to achieve low cost operations has a critical effect on operational performance, the study reveals. Cost focused and operational based firms like the logistics providers should most pointedly and excellently so, achieve cost reduction as the bare minimum for competitive advantage. Cost focus strategy enables a firm to adopt a mix of low cost production or operational measures in order to pass the benefits to all the parties in terms of improved pricing of the products and services they offer. This is critical to supply chain performance, particularly in dealing with the documented high proportion of price proportion of as high as 35% attributable to supply chain cost.

The findings of this study further revealed that that there was a significant moderation effect of regulation on the relationship between all the lean practices and operational performance of third party port-centric logistics firms in Kenya. This consequently implies that in a significant way, the operational performance was either depressed or

reinforced by the presence of the moderation. The study was generally successful and relations were demonstrated that all the four lean practices were associated with operational performance.

The results, scope and deliberations in this study opens a new axis through which lean practices, lean thinking or even lean philosophy can be interrogated in any context at large, and in a specific way in services particularly in third party port-centric logistics services. Logistics services is one of the key stimulant of any broad based economy such as the Kenyan economy which is dynamic and fast growing. This becomes even exciting with the building of the second cargo port in Lamu that will the more open the logistics axis in the region by handling more tonnage and bulky cargo for the hinterland and beyond.

#### **5.4 Study Recommendations**

Based on the findings, this study recommends third party port-centric logistics services providers in Kenya, not only continue embracing quality management systems but also formalize quality systems and integrate it with the organizational culture. This will not only foster and improve operational performance but as well boost the overall firm performance effectively expanding the fundamentals of these firms.

In synch with the Resource Based View (RBV) which underpins the need for firms to accumulate resources and capabilities that are rare and valuable. This study recommends that 3PL firms through waste management programmes must continuously strive to save and release important resources for use in other areas of the organization, particularly operations, in order to acquire and sustain competitive advantage. The study also recommends that logistics services providers should seek to cumulate the effect of wastage and see how it affects her efficiency and productivity as a starting point. Such wastage as; idle capacity in terms of labor, equipment and machines and space; wastage in movement due to poor facility layout as well as wastage in handling and movement of goods placed in wrong areas, negatively affect operational performance directly, regardless of the level of regulation.

It is obligatory that the effort to manage wastage be clearly defined and that 3PL firms and other stakeholders in logistics services business continue engaging in identifying new ways and interventions to curb wastage in their operations. This undertaking will not only continuously step up operational performance of individual firms but also result in effective supply chains for all other firms with port-centric linkage. Therefore, there is need for all stakeholders to engage and work together to achieve the all-round benefits associated with superior supply chain networks for the good of the sector.

This study also recommends that 3PL firms must appreciate the role they play in the supply chain networks of their respective clients who must deliver value as well to their respective customers. As such, therefore, logistics services providers must continuously and unreservedly, not only for monetary compensation only, but for the sake supply chain performance and business linkages continuously facilitate and allow for an effective and efficient supply chains to function and thrive by play their role in the best way possible. It is a reality that legal and regulatory aspects will always be part of any business environment. This therefore should not be a 'forever' excuse for non-performance. In the light of this reality, this study recommends that 3PL firms, although negatively affected by regulatory framework, take it upon themselves to device smart quality, customer, cost and waste management strategies that will enable them compete and emerge victorious in operational performance and in the competitive battle.

Finally, 3PL firms in Kenya, need to be well equipped both internally and with a back-up of external regulatory mechanisms that work to support and not to inhibit. This study recommends that policy makers and regulators in third party port-centric logistics services sector and other actors work together in order to create a positive industry environment where regulation works for a positive business environment by balancing the all the parties interests.

### **5.5 Suggestions for Further Research**

The study concentrated on only four variables; quality management, waste management, customer orientation and cost management. In future, there is need to replicate this study in other service industries with expanded variables and compare

the results with other studies. Third party logistics providers business is also largely dependent on other critical players such as regulators, port operations, providers of financial services, amongst others. An industry wide study can be conducted on all these firms and bring in more moderators and test the relations and the impact of all these on logistics services operational performance.

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## **APPENDICES**

### **Appendix I Letter of Introduction**

I am a student at Jomo Kenyatta University of Science and Technology (JKUAT) undertaking a doctoral degree (Ph.D) in Supply Chain Management. I am carrying a thesis study on “lean practices and operational performance of third party port-centric logistics firms in Kenya”

This research aims at understanding how your logistics firm manages operations in order to achieve high performance and efficiency. It also seeks to identify the lean practices or quality management practices in-order to add to existing knowledge and inform on areas of interventions at the firm and policy levels. There will be no wrong or right answer to the questions asked in this questionnaire. The raw data collected from this survey will be kept confidential and will be used strictly for academic purposes only. This study will be conducted in utmost ethical manner.

Your honest participation in this survey is highly appreciated in advance.

## **Appendix II Research Questionnaire**

The purpose of this questionnaire is to collect data that will help in investigating lean practices and operational performance of third party port-centric logistics firms in Kenya. The questionnaire will target departmental heads in these firms.

Note:

- i.) The information you will provide through this questionnaire will solely be used for academic purposes only.
- ii.) All responses will be treated with strict confidentiality.
- iii.) Incase an item is not filled up satisfactorily, please provide you telephone number so the researcher can confirm with you 07.....

### **SECTION A: GENERAL INFORMATION**

1. **Name of your firm or organization (Optional)** \_\_\_\_\_
2. How long (in years) has your firm/organisation been running logistics business in Kenya?  
0-1       1-5       5-10       Over 10
3. **Please specify your department** \_\_\_\_\_ **(e.g. Procurement, Port operations, Transport, Human Resources, Maintenance )**
4. **Please tell us the size of your firm in terms of employee size:**
  - Less than 20 Employees**
  - Between 20 and 50 employees**
  - Between 50 and 100 employees**
  - Above 100 Employees**
5. **Please specify the ownership structure of your firm or organization:**
  - Local**
  - International**
  - Both**
6. **Please specify (by a tick) the areas of logistic operations your firm is engaged in.**



	Statement	Mean Monthly Frequency of Occurrence in the last one year					Frequency				
		0	1-5	6-10	11-20	Above 20	Never	Rarely	Sometimes	Often	Very often
1.	The frequency of breakdown of equipment (cranes, operations vans/cars, and others) affecting logistics operations.	1	2	3	4	5	1	2	3	4	5
2.	The rate at which jobs and tasks are repeated because of human mistakes.	1	2	3	4	5	1	2	3	4	5
3.	Frequently at which demurrages accumulate for cargo that is late in handling or delivery/picking.	1	2	3	4	5	1	2	3	4	5
4.	Frequency of damaged cargo during movement to and from the port/yard/CFS.	1	2	3	4	5	1	2	3	4	5
5.	Customer Complaints (voice of the customer) are ignored in planning and making changes in logistics plans.	1	2	3	4	5	1	2	3	4	5

**SECTION C: WASTE MANAGEMENT PRACTICE**

- (a.) Does your organization have in place an efficient way of managing personnel shifts and schedules to ensure efficient workflow in order to minimize manpower wastages?      Yes      No

- (b.) My organization has implemented the following lean waste management issues in order to deal with wastage of any aspect in operations and logistics. Please tick (√) where appropriate.

No.	Waste Management Issue	Tick (√)
1.	Set up time reduction and management	
2.	Lot sizes for efficient handling	
3.	Continuous workflow of equipment, materials and personnel	
4.	Bottlenecks elimination in operations and logistics	
5.	Equipment maintenance and replacement management	
6.	Cycle time reduction and management	

- (c.) Below are some statements that describe how third party port-centric logistics firms practice lean. Please indicate your agreement or disagreement with these lean issues in your organization. Please tick the appropriate box where 5-Very often; 4-Often; 3-Sometimes; 2-Rarely; 1-Never. There are no right and wrong answers, just express your opinion.

		Mean Monthly Frequency of Occurrence in the last one year					Frequency				
		0	1-5	6-10	11-20	Above 20	Never	Rarely	Sometimes	Often	Very often
1.	Equipment/machines picking/dropping cargo in wrong places.	1	2	3	4	5	1	2	3	4	5

2.	Engaged in non-value adding activities and tasks in handling	1	2	3	4	5	1	2	3	4	5
3.	“Quick fix” type of repairs of broken down logistics equipment such as cranes, Chassis and movers.	1	2	3	4	5	1	2	3	4	5
4.	Shortage of personnel in the logistics function due to wrong scheduling.	1	2	3	4	5	1	2	3	4	5

**SECTION D: CUSTOMER ORIENTATION (LEAN PRACTICE)**

- (a) Does your organization have a specific and elaborate programme for recruiting and sustaining the logistics customers?

Yes  No

If YES, please give more details.

.....  
 .....  
 .....

- (b) How flexible is your organisation in tailoring logistics services to customer requirements? Please explain.

.....  
 .....  
 .....

- (c) Explain the level of employee sensitization and training on efficient and effective logistics procedures in your organisation.

.....  
 .....  
 .....

(d.) What measures has your organisation put in place to ensure continuous and excellent services to the customers.

.....  
 .....  
 .....

(e.) In your opinion, do you think your organisation is well/highly equipped to fulfill customer needs? Please explain.

.....  
 .....  
 .....

(f.) Would you describe your firm as “innovation driven” in designing customer solutions to their logistics needs. Please explain.

.....  
 .....  
 .....  
 .....

(g.) **Below are some statements that describe how third party port-centric logistics firms practice lean. Please indicate your agreement or disagreement with these lean issues in your organization. Please tick the appropriate box where 5-Very often; 4-Often; 3-Sometimes; 2-Rarely; 1-Never. There are no right and wrong answers, just express your opinion.**

		Mean Monthly Frequency of Occurrence in the last one year	Frequency
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		0	1-5	6-10	11-20	Above 20	Never	Rarely	Sometimes	Often	Very often
1.	Customer complaints	1	2	3	4	5	1	2	3	4	5
2.	Service failure occasioned by poor internal employee sensitization.	1	2	3	4	5	1	2	3	4	5
3.	Ignoring customer feedback for service improvement	1	2	3	4	5	1	2	3	4	5
4.	Poor services due to lack of formal training on customer care	1	2	3	4	5	1	2	3	4	5
5.	Management ignoring team building opportunities for customer care improvement	1	2	3	4	5	1	2	3	4	5

## SECTION E: COST MANAGEMENT (LEAN PRACTICE)

(a.) **Which of the following specific logistics services interventions has your organisation invested in the near past in order to achieve improved operations cost advantage? (Please tick the applicable choices)**

- Equipment modernization
- Employee Training and Development
- Hiring of Quality Staff
- Market Expansion Campaigns
- Introduction/Improvement Customer Helpdesk



Introduction of quality systems

- (b.) **Below are some statements that describe how third party port-centric logistics firms practice lean. Please indicate your agreement or disagreement with these lean issues in your organization in the last one year of operation. Please tick the appropriate box where 5-Very often; 4- Often; 3-Sometimes; 2-Rarely; 1-Never. There are no right and wrong answers, just express your opinion.**

No.	Statement	Never	Rarely	Sometimes	Often	Very often
1.	Management ignores effort to ensure every member of the organization is sensitized on cost saving measures in order to improve the overall performance of the organizations.	1	2	3	4	5
2.	The organisation does not invest regularly on modern equipment in order to support efficient logistics services and operations.	1	2	3	4	5
3.	The ICT infrastructure for the organisation is slow and inefficient in helping the firm achieve an efficient logistics services.	1	2	3	4	5
4.	Shifts and task-personnel-equipment are usually not well customized to stem out tasks overlap and increase efficiency for better operations performance.	1	2	3	4	5
5.	The logistics and operations function is under-funded in order to achieve efficient logistics	1	2	3	4	5

infrastructure for improved operational performance.					
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## SECTION F: REGULATION

Below are some statements that describe how third party port-centric logistics firms practice lean. Please indicate your agreement or disagreement with these lean issues in your organization in the last one year of operation. Please tick the appropriate box where 1-Strongly Disagree; 2-Disagree; 3-Neutral; 4-Agree; 5-Strongly Agree. There are no right and wrong answers, just express your opinion.

No.	Statement	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1.	The tight government regulation and controls through statutory bodies such as KRA, KeBS, KEPHIs and others affect the operational performance of our organization.	1	2	3	4	5
2.	Tight controls and procedures by Kenya Ports Authority affect our organizations' effort to achieve efficiency and greater operational performance.	1	2	3	4	5
3.	Industry licensing through KIFWA and other regulators such as Kenya Transport Authority effect the operational performance of our business.	1	2	3	4	5
4.	The regulatory environment on third-part port-centric logistics firms in Kenya offers conducive environment for firms to thrive and perform their logistics activities better.	1	2	3	4	5

## SECTION G: OPERATIONAL PERFORMANCE

Below are some specific statements that describe how third party port-centric logistics firms can account for change in performance. Please rate these operational performance lean issues in your organization in the last one year of operation. Tick the appropriate box in a scale of 1-5; where 1-Quite Insignificant, 2- Insignificant; 3-Neutral; 4- Significant; 5- Highly Significant. There is no right or wrong answer, just express your opinion please.

		Mean % Change in the last one year					Significance Change Levels				
		Above 30	16-30	6-15	1-5	0	Highly Significant	Highly Significant	Neutral	Insignificant	Highly Insignificant
1.	Customer orders and requests	1	2	3	4	5	1	2	3	4	5
2.	Deliveries as per customer requests	1	2	3	4	5	1	2	3	4	5
3.	Cost of logistics services offered	1	2	3	4	5	1	2	3	4	5
4.	Overall output and productivity	1	2	3	4	5	1	2	3	4	5
5.	Customer satisfaction level	1	2	3	4	5	1	2	3	4	5
6.	Synchronization of changes in schedules and plans with change in customer requirements	1	2	3	4	5	1	2	3	4	5
7.	Turn around time in logistics services	1	2	3	4	5	1	2	3	4	5

### Appendix III Description of the Factors of Study Variables

<b>Item</b>	<b>Description</b>	<b>Sub-Construct</b>	<b>Construct</b>
QM1	The frequency of breakdown of equipment affects logistic operations	Equip. Down time	Quality Management Practice (QM)
QM2	The rate at which jobs and tasks are repeated because of human mistakes	Damages	
QM3	Demurrages accumulate for cargo that is late in handling or delivery/picking	Demurrages	
QM4	Damaged cargo is detected during movement to and from the port/yard/CFS	Damages	
QM5	Customer complaints are ignored in planning and making changes in logistics plans	Demurrages	
WM1	Equipment/machines picking/dropping cargo in wrong places	Frequency of Handling	Lean Waste Management (WM)
WM2	Engaged in non-value adding activities and tasks in handling.	Frequency of Handling	
WM3	Repair of broken down logistics equipment such as cranes, chassis and movers	Equipment availability	
WM4	Shortage of personnel in the logistics function during peak times	Personnel availability	
CO1	Customer complaints	Customer Helpdesk	Customer Orientation (COM)

CO2	Service failure occasioned by poor internal employee sensitization.	Wide customer care awareness	
CO3	Ignoring customer feedback for service improvement	Feedback/feedforward mechanism	
CO4	Poor services due to lack of formal training on customer care	Customer Helpdesk	
CO5	Management ignoring team building opportunities for customer care improvement	Wide customer care awareness	
CM1	Management ignores effort to ensure every member of the organization is sensitized on cost saving measures in order to improve the overall performance of the organizations.	Cost sensitivity	
CM2	The organisation does not invest regularly on modern equipment in order to support efficient logistics services and operations.	Modern Equipment and machines	
CM3	The ICT infrastructure for the organisation is slow and inefficient in helping the firm achieve an efficient logistics services.	Modern Equipment and machines	
CM4	Shifts and task-personnel-equipment are usually not well customized to stem out tasks overlap and increase efficiency for better operations performance.	Task-process mapping	

CM5	The logistics and operations function is under-funded in order to achieve efficient logistics infrastructure for improved operational performance.	Cost sensitivity	
RG1	The tight government regulation and controls through statutory bodies and others affect the operational performance	Government regulation	Regulation (REGS)
RG2	Tight controls by Kenya Revenue Authority affect organization's effort to achieve efficiency and greater operational performance of our business	Government regulation	
RG3	Industry licensing through KIFWA and other regulators such as Kenya Transport Authority effect the operational performance of our business	Industry regulation	
RG4	The regulatory environment on third-party port-centric logistics firms in Kenya offers conducive environment for firms to thrive and perform their logistics activities better	Internal regulation mechanism\	

#### Appendix IV Normality Test Results

	N	Mean	Std. Error	Std. Dev.	Var.	Skewness	Std. Error	Kurtosis	Std. Error
QualityMgt	124	3.1599	.02487	.27699	.077	.047	.217	1.620	.431
WasteMgt	124	3.6714	.07771	.86530	.749	-1.262	.217	8.937	.431
CustOMgt	124	3.5491	.05656	.62985	.397	.143	.217	-.531	.431
CostMgt	124	3.2946	.04282	.47680	.227	-2.619	.217	9.176	.431
Regulation	124	1.9391	.05287	.58876	.347	1.754	.217	4.302	.431
OpsPerf	123	3.2734	.03515	.38980	.152	.463	.218	.449	.433

**Appendix V Mahalanobis Distance Test Results**

<b>MAHALA_1</b>	<b>P2</b>	<b>Outliers</b>
16.75709	.00498	0
13.39051	.01998	0
13.03491	.02305	0
12.33805	.03044	0
12.27370	.03122	0
11.14610	.04856	0
10.64586	.05887	0
9.91113	.07779	0
9.80205	.08104	0
9.31453	.09716	0
9.06365	.10655	0
9.06365	.10655	0
9.02665	.10801	0
9.00049	.10904	0
8.01708	.15530	0
7.17094	.20823	0
7.17094	.20823	0
6.92375	.22637	0
6.92375	.22637	0
6.92375	.22637	0
6.71349	.24283	0
6.71349	.24283	0
6.67778	.24573	0
6.62418	.25012	0
6.59362	.25266	0
6.56943	.25468	0
6.56943	.25468	0





4.13522	.53012	0
4.10044	.53505	0
4.10044	.53505	0
4.10044	.53505	0
4.10044	.53505	0
3.68304	.59589	0
3.67337	.59733	0
3.50055	.62330	0
3.32473	.65006	0
2.84951	.72317	0
2.58836	.76313	0
2.26922	.81078	0
1.64714	.89549	0
1.62774	.89787	0
1.55552	.90657	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.41641	.92251	0
1.36907	.92767	0
1.36907	.92767	0
1.36907	.92767	0
1.36907	.92767	0



.58384	.98873	0
.58384	.98873	0
.58384	.98873	0
.58384	.98873	0
.58384	.98873	0
.58384	.98873	0
.58384	.98873	0
.58384	.98873	0
.47585	.99298	0

## Appendix VI Descriptive Analysis for Quality Management

Quality Management Issues	0 (%)	1-5 (%)	6-10 (%)	11-20 (%)	Never (%)	Rarely (%)	Sometimes (%)	Often (%)
Frequency of breakdown	8.1	82.3	8.7	0.8	0	25.2	70.4	2.4
Rate jobs and tasks repetition	21	73	4.0	1.6	2.0	21.0	73.2	0.0
Freq. demurrages accumulation	18	75.4	6.6	0.0	23.2	72.4	2.2	1.6
Frequency of damaged cargo during movement	22	46.6	31.4	0.0	22.6	73.4	4.0	0.0
Freq. of Customer Complaints	21	74.2	4.8	0.8	18	75.4	6.6	0.8

**Appendix VII Descriptive Analysis for Waste Management**

<b>Waste Management Issue</b>	<b>0 (%)</b>	<b>1-5 (%)</b>	<b>6-10 (%)</b>	<b>11-20 (%)</b>	<b>Never (%)</b>	<b>Rarely (%)</b>	<b>Sometimes (%)</b>	<b>Often (%)</b>
Picking/dropping cargo in wrong places	8.2	87.7	4.1	1.6	21.0	75.0	4.0	0.0
Engaged in non-value adding activities	22.6	73.4	1.8	0.8	8.2	85.2	5.1	0.0
“Quick fix” repairs of broken equip.	16.4	77.6	5.3	0	17.7	77.1	4.4	0.0
Personnel Shortage in logistics	17.7	76.6	5.6	0.8	23.4	73.4	3.2	0.0

**Appendix VIII      Summary of Customer Orientation Management Issues Addressed through Qualitative Data**

Statement	Main Issues Raised by Firms	Explanation
Flexibility of firms in tailoring logistics services that match customer needs	Tailored logistics services; Addressing customers issues fast	Majority (65%) Affirmed whereas much less (30%) had no such flexibility interventions in their firms. About 5% of the respondents was a non-response.
Level of employee sensitization and training on logistics procedures for better customer service.	Training on customer care; departmental discussions on continuous improvement; Team building sessions; Monetary rewards to boost employee’s morale.	Majority (87.7%) engaged in employee sensitization for better customer service. Others (12.3%) they have never engaged in employee sensitization.
Measure in place to ensure continuous and excellent customer services	<p><b>Majority:</b></p> <p>Training of employees on customer care; Customer relationship management; Creation of customer care help desk; Rewarding loyal customers</p> <p><b>Others:</b></p> <p>Establishment of feedback mechanisms; Online social media customer engagement; Customer satisfaction surveys.</p>	Majority (90%) of the respondents identified four issues while others (10%) identified only two issues.

**Appendix VIII      Summary of Customer Orientation Management Issues Addressed through Qualitative Data  
(Continued)**

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Availability of equipment to fulfil customer needs	Well trained staff in customer relationship; well-maintained machines; ICT support services	Majority (92.7%) of the respondents highlighted three issues while a few (7.3%) was a non-response
Whether firms are innovation driven in providing customer logistics solutions	Training staff on customer traits; Investment in superior information systems; Use of customer feedback to improve services	Majority (60%) highlighted the three issues whereas another dominant group (40%) was not sure of this phenomenon.

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**Appendix IX Descriptive Analysis for Customer Orientation Management**

<b>Customer Orientation Management Issue</b>	<b>0 (%)</b>	<b>1-5 (%)</b>	<b>6-10 (%)</b>	<b>11-20 (%)</b>	<b>Never (%)</b>	<b>Rarely (%)</b>	<b>Sometimes (%)</b>	<b>Often (%)</b>
Frequency of customer complaints	15	76.4	6.3	1.6	8.2	87.7	4.1	1.6
Rate of Service failure	31.4	46.6	21	0	22.6	73.4	4.0	0
Ignoring customer feedback (Rate)	19	74.4	6.6	0	22	46.6	3.4	0
Poor services due to poor customer care	18	75.4	6.6	0	8.2	87.7	4.1	0
Mgt ignoring team building opportunities	20.0	48.6	31.4	0	22.6	73.4	4	0

**Appendix X Descriptive Analysis for Operational Performance**

<b>Operational Performance Issue</b>	<b>Above 30-%</b>	<b>16-30-%</b>	<b>6-15-%</b>	<b>1-5-%</b>	<b>0-%</b>	<b>Highly Sign. -%</b>	<b>Significant-%</b>	<b>Neutral-%</b>	<b>Insignificant</b>	<b>Highly Insign. -%</b>
Customer orders and requests	0	2.4	72.4	25.2	0	0	2.4	71.5	2.6	0
Deliveries as per customer requests	0	4.0	22.6	73.4	3.6	0	3.6	4.0	71.8	0
Cost of logistics services offered	0	3.6	5.6	74.1	16.7	0	0	5.6	76.6	17.7
Overall output and productivity	0	21.0	66.9	8.9	0	1.6	7.2	74.8	16.4	0
Customer satisfaction level	4.2	66.4	28.6	0.8	0	0	3.4	63.9	31.9	0
Matching schedules to customer reqs.	0	2.6	4.0	73.4	20.0	0	4.1	60.7	35.2	0
Turnaround time in logistics services	0	1.6	5.6	75.0	17.7	0	3.3	54.5	42.3	0

**Appendix XI List of Third Party Port-Centric Logistics Firms in Kenya (KRA,  
2016)**

<b>S/N</b>	<b>Name of Logistics Firm</b>	<b>Town</b>	<b>Tel</b>
1	GIFTLINE FREIGHT SERVICES LTD.	NAIROBI	020-2044488
2	RUSINGA INT FREIGHT LTD.	NAIROBI	556013
3	MURANGA FORWARDERS LTD.	MOMBASA	020-220163
4	DOT. COM. CONSULTANTS CO.	MOMBASA	041-2317030
5	PORTLINK LOGISTICS LTD.	MOMBASA	041-2312660
6	DANJAM INVESTMENTS CO. LTD.	MOMBASA	020-210781
7	MUSTAFA FREIGHT FORS LTD.	NAIROBI	0722-207795
8	WOLFENBERG INTERNATIONAL	NAIROBI	0728-896840
9	GISENYA FREIGHT LOGISTICS LTD.	NAIROBI	6004424
10	AL-MUSTAQIM TRADING CO. (K) LTD.	MOMBASA	722521587
11	PAMOL CONNECTIONS	MOMBASA	0722-115124
12	MOHABAB ENTERPRISES LTD.	NAIROBI	020-603784
13	VINEP FORWARDERS LTD.	NAIROBI	2719002/3
14	DEEPMARK CARGO LTD.	NAIROBI	020-2243961
15	METEOR FREIGHT FORWARDERS LTD.	NAIROBI	020-557322
16	POLYGON LOGISTICS LTD.	NAIROBI	020-822777
17	PINNACO LOGISTICS LTD.	NAIROBI	0720-936058
18	TRADE HAUS & GLOBAL LOGISTICS	MOMBASA	0724-504637
19	SIMPTONS EA. HOLDINGS LTD.	NAIROBI	
20	KENAFRIC INDUSTRIES LTD.	NAIROBI	02055566-68
21	SEAWAY MARITIME LTD.	NAIROBI	0722-317153
22	FAMO FORWARDERS LTD.	MOMBASA	2311945
23	VISION ENTERPRISES LTD.	NAIROBI	020-2340070
24	MIDSTAR FORWARDERS CO. LTD.	MOMBASA	041-2229592
25	LOGWIN AIR AND OCEAN (K) LTD.	NAIROBI	0727-574552
26	SUPER QUICK FREIGHTERS LTD.	NAIROBI	0722-759914

27	PLAINLANDS INT FR LOGISTICS LTD.	NAIROBI	020-343133
28	MESOHLINK LTD.	NAIROBI	0722-345818
29	BLUE HILL INVESTMENTS LTD.	NAIROBI	2219027
30	NIBAL FREIGHTERS LTD.	MOMBASA	041-2234521
31	JIPE HOLDINGS LTD.	NAIROBI	0722-529300
32	FREIGHTWELL EXPRESS LTD	MOMBASA	041-2229784/6
33	GREENBELT LOGISTICS LTD.	MOMBASA	041-2315810
34	GOLDEN FREIGHT SERVICES	MOMBASA	041-2315810
35	PRINCIPAL FORWARDERS LTD.	MOMBASA	2228448/2223482
36	BLUERANGE LOGISTICS LTD.	NAIROBI	020-2603242
37	ROSAKAL INVESTMENTS LTD.	MOMBASA	0722723956
38	PROVINCIAL C&F LTD.	MOMBASA	2311245/6
39	ONGOING CARGO SERVICES LTD.	NAIROBI	827271
40	ERI KENYA LTD.	NAIROBI	041-2318101
41	BOLLORE AFRICA LOGISTICS (K) LTD.	NAIROBI	6421000
42	BILATERAL SEMITE SAP LTD.	MOMBASA	041-2222578
43	AL-AQMAR FORWADERS LTD.	MOMBASA	2317742
44	FILMLINE LTD.	NAIROBI	020-6006551
45	LAND BRIDGE FREIGHTERS	MOMBASA	041-2222484
46	ANDY FORWARDERS SERVICES LTD.	NAIROBI	827084
47	CALL FAST SERVICES LTD.	NAIROBI	020-827684
48	SMART CHOICE SERVICES LTD.	MOMBASA	0722-529328
49	PENTAGON FREIGHT FORD LTD.	NAIROBI	0723-342390
50	POLO AUTO FREIGHT FORWARDERS	MOMBASA	722976676
51	RIPE FREIGHT SERVICES LTD.	MOMBASA	041-2227241
52	DAP LOGISTICS LTD.	MOMBASA	041-2312229
53	ACTIVE FORWARDERS LTD.	MOMBASA	041-2312141
54	THREEWAYS SHIPPING SERVICES LTD.	MOMBASA	2317509
55	SINZA FREIGHT AND LOGISTICS	MOMBASA	722390371
56	SUPERSONIC C&F SERVICES	NAIROBI	651185/6/7
57	LUXYWAYS LTD.	MOMBASA	721429202

58	FREIGHT WINGS LTD.	NAIROBI	822085
59	SAMSY INTERNATIONAL	NAIROBI	733777122
60	BAMBURI SHIPCHANDLERS (K) LTD.	MOMBASA	041-2317295
61	AFRIFRESH CONVEYORS LTD.	NAIROBI	725039660
62	DUTY LOGISTICS LTD.	NAIROBI	720704195
63	KIAMBA CLEARING & FORWARDING	NAIROBI	6534410
64	JOWAKA SUPER LINKS LTD.	NAIROBI	020-2532729
65	TRIBERTO (K) LTD.	MOMBASA	041-222964
66	ALUJO ENTERPRISES CO. LTD.	MOMBASA	722384653
67	URGENT CARGO HANDLING LTD.	NAIROBI	2229567
68	GAMARA INVESTMENTS LTD.	MOMBASA	041-2317740
69	TRANSOCEANIC P. DEV (K) LTD.	MOMBASA	041-2319704
70	KENYA BONDED WAREHOUSE	MOMBASA	2311577
71	SEALINE LOGISTICS LTD.	NAIROBI	3504882
72	REPLAN CARGO HANDLING SERVICES	MOMBASA	041-2319596
73	MWAMBA FREIGHT SERVICES LTD.	MOMBASA	020-2630262
74	COMPLAST INDUSTRIES LTD.	NAIROBI	020-2326227/8
75	NEW WIDE GARMENTS (K) EPZ LTD.	ATHI RIVER	045-6626077
76	ALLIANCE LOGISTICS (K) LTD.	NAIROBI	020-552817
77	HAPPY WORLD FREIGHTERS LTD.	NAIROBI	020-3586138
78	FRANK AND GEOFFREY CARGO LTD.	NAIROBI	020-3577703
79	EREMO STORES LTD.	NAIROBI	4446046
80	REGIONAL ENTREPRENEURS (K) LTD.	NAIROBI	722514335
81	FILIKEN TRANSIT FORWARDERS LTD.	MOMBASA	2490291
82	SPEEDEX LOGISTICS LTD.	NAIROBI	020-202077
83	GLOBAL BUSINESS COMMANDERS	MOMBASA	041-2229381
84	MUZDALIFA C&F LTD.	MOMBASA	041-2317012
85	VICTORY FREIGHTERS LTD	NAIROBI	0722-600301
86	UNIGLOBE LOGISTICS	MOMBASA	72696632
87	SIMCON FREIGHT LTD.	MOMBASA	0733-383838
88	STEFRA CONSULTANCY AGENCIES	NAIROBI	312220

89	FRA ALEX TOP FREIGHTERS LTD.	NAIROBI	020-312220
90	REALTIME FREIGHT PERFORMANCE	NAIROBI	0722-769725
91	INTL COMMITTEE OF THE RED CROSS	NAIROBI	828220/1/2
92	AIR-CONNECTIONS LTD	NAIROBI	020-2122194
93	LYNX LOGISTICS LTD.	MOMBASA	2318600
94	SPEDAG INTERFREIGHT (K) LTD.	MOMBASA	0722204245
95	SAMEDAY CARGO FORWARDERS LTD.	NAIROBI	020-3617873
96	FREIGHT LOGISTICS LTD.	NAIROBI	020-8096608
97	DANJOS INTERNATIONAL AGENCIES	MOMBASA	0722103961
98	FREIGHT FORWARDERS (K) LTD.	MOMBASA	2227573/5
99	RENAISSANCE LTD.	ATHI RIVER	020651228
100	KEN-KNIT (K) LTD.	ELDORET	053-2032644/5
101	AKAMAI FREIGHT FORWARDERS LTD.	NAIROBI	0727298830
102	GULF CROSS LTD.	MOMBASA	0722869761
103	EXCELLENT LOGISTICS LTD.	NAIROBI	0202337024
104	EVERLAST ENTERPRISE LTD.	NAIROBI	210472
105	SUPER FIRST FORWARDERS LTD.	NAIROBI	828740
106	K. B. FREIGHTERS LTD.	MOMBASA	041-2316292
107	SILICON FREIGHT INTL CO. LTD.	MOMBASA	0722313424
108	SKYLIFT CARGO LTD.	NAIROBI	828639
109	FREIGHT COMMANDOS LTD.	NAIROBI	020-4454309
110	MABES ENTERPRISES LTD.	MOMBASA	0722566749
111	RELIABLE FREIGHT SERVICES LTD.	MOMBASA	041-2316714/5
112	TREASURE CARGO SERVICES LTD.	NAIROBI	342211
113	JAMREKS ENTERPRISES	MOMBASA	0722586052
114	LINK AFRIQUE (K) LTD.	NAIROBI	826243
115	GENERAL FREIGHTERS LTD.	NAIROBI	827354/7
116	TRACMI FREIGHTERS LTD.	MOMBASA	
117	CONVENTIONAL CARGO CONVEYORS LTD.	NAIROBI	6537766/9
118	ASK CARGO LTD.	NAIROBI	020-4444128

119	WORLD RHINE FORWARDERS LTD.	NAIROBI	020-2466745
120	SUPERIOR CARGO CONVEYORS LTD.	NAIROBI	020-827220
121	SUPER FREIGHT LTD.	NAIROBI	0722708636
122	PANAL FREIGHTERS LTD.	MOMBASA	2315068
123	TRIOSTAR AGENCIES (K) LTD.	NAIROBI	020-2246754
124	NGOZI LTD.	MOMBASA	0736735319
125	FREIGHT IN TIME LTD.	NAIROBI	827248
126	IMENTI FREIGHT LTD.	NAIROBI	020-2379510
127	SUNA FREIGHTERS	SUNA	0722466262
128	FLOWERPORT LOGISTICS LTD.	NAIROBI	0720-774520
129	COAST PROFESSIONAL FREIGHTERS	MOMBASA	2496058
130	WANANCHI MARINE PRODUCTS LTD.	MOMBASA	041-2220517
131	TRANSONIC LOGISTICS LTD.	NAIROBI	072272182
132	TELLAM FREIGHT FORWARDERS LTD.	MOMBASA	0722282322
133	AFRICA DIRECT LTD.	NAIROBI	
134	MODA FREIGHT FORWARDERS LTD.	MOMBASA	2317818
135	UNIMAR LOGISTICS LTD.	MOMBASA	2220165
136	FEDERAL FREIGHT & TRANSPORT	NAIROBI	020-2098732
137	EYEBLINK FREIGHT MANAGEMENT	MOMBASA	2319289
138	DECCAN FREIGHT LOGISTICS	MOMBASA	041-2312020
139	SKYLARK CONVEYORS (K) LTD.	NAIROBI	020-2240451
140	VENUS KENYA LTD.	MOMBASA	020-8020469
141	CARGO NEST (K) LTD.	NAIROBI	020-312964
142	ATACO FREIGHT SERVICES LTD.	MOMBASA	2229634
143	OKAMOTO FREIGHT SERVICES LTD.	NAIROBI	822198/2131075
144	STARWAY INTL F & FOWARDERS LTD.	MOMBASA	0711104410
145	BAHARI FORWARDERS LTD.	MOMBASA	22234098
146	KENVILLA LOGISTICS LTD.	MOMBASA	0725258320
147	KENTAN CONNECTIONS LTD.	MOMBASA	041-2227178
148	MUSTAFA MOHAMED ISSA LTD.	MOMBASA	020-2314881
149	TRIPPLE TWIN LOGISTICS LTD.	NAIROBI	020-2638896

150	WILLMON FREIGHT AGENCIES	NAIROBI	0722731853
151	MENTAP RESOURCE FREIGHT LTD.	NAIROBI	020-2495083
152	MAGNATE LOGISTICS LTD.	NAIROBI	0722634150
153	FANTASHI FREIGHTERS & LOGISTICS	NAIROBI	0722234824
154	ONWARD CARGO SYSTEM CO. LTD.	NAIROBI	827170
155	F. Y. SIMBA SHIPPING AGENTS	MOMBASA	2312377
156	INTRASPEED ARCPRO (K) LTD.	NAIROBI	020-828502/3
157	ROLLING CARGO LTD.	MOMBASA	041-2319663
158	CHARITIES LOGISTICS LTD.	MOMBASA	041-2222451
159	GOLDFIELDS LOGISTICS LTD.	NAIROBI	020-341114
160	BOLT SPEED CARGO FORWARDERS	NAIROBI	0738413701
161	MANGO VISION FREIGHTERS LTD.	MOMBASA	XXXX
162	LLOYDS LOGISTICS LTD.	MOMBASA	0723217490
163	TRANSFREIGHT LOGISTICS LTD.	MOMBASA	041-3430265
164	TEOS COMPANY LTD.	MOMBASA	041-224750
165	INTIME FORWARDERS LTD.	NAIROBI	020-3545436
166	PRAFULA ENTERPRISES LTD.	NAIROBI	020-2021204
167	KAISER AGENCIES LTD.	MOMBASA	2223174
168	TROPICAL SKY CAEGO LTD	NAIROBI	020-4454435
169	CAPRICON FREIGHT FORWARDERS	MOMBASA	412316867
170	SEA LORD AGENCIES	MOMBASA	0722654355
171	S AND L PORT SOLUTIONS LTD.	MOMBASA	0722858274
172	CIRCLE LINES AGENCY LTD.	NAIROBI	2241011
173	SEACON (K) LTD.	MOMBASA	0722965852
174	ABAADILA ENTERPRISES LTD.	NAIROBI	020-676219
175	BASELINE LOGISTICS (K) LTD.	NAIROBI	0722381619
176	ZOMU LOGISTICS LTD.	NAIROBI	0721360065
177	FAIR LOGISTICS AGENCY LTD.	MOMBASA	0722353372
178	SAHARA CLEARING & FORWARDING	NAIROBI	2217848/9
179	SEDO LOGISTICS LTD.	NAIROBI	020-2333088
180	TRANSNET FREIGHT INTERNATIONAL	NAIROBI	020-2141799



181	KENFREIGHT (E.A.) LTD.	MOMBASA	236800/1/2
182	BECOZI INVESTMENTS	MOMBASA	0722825703
183	KENYA DUTY FREE COMPLEX	NAIROBI	827123/5
184	DIPLOMATIC DUTY FREE LTD.	NAIROBI	827123/5
185	UNITED CLEARING COMPANY LTD.	MOMBASA	041-2225882
186	BAKRIZ HOLDINGS LTD.	MOMBASA	0722415352
187	MABATI ROLLING MILLS LTD.	ATHI RIVER	020-6427000
188	MACSIM CARGO SERVICES	NAIROBI	020-2248743
189	CONSOLIDATED (MSA) LTD	MOMBASA	2494481/85
190	HAMBU FREIGHT SERVICES LTD.	MOMBASA	2222850
191	ISSA CLEARING & FORWARDING CO.	MOMBASA	041-2221619
192	PRECISE LOGISTICS LTD.	NAIROBI	828060/1
193	AFRIQ FREIGHT SERVICES LTD.	NAIROBI	020-2614511/12
194	FOX INTERNATIONAL LOGISTICS LTD.	NAIROBI	827964/5
195	BLUE LIME LTD.	NAIROBI	041-2315445
196	RED ANCHOR FR. FORWARDERS LTD.	NAIROBI	020-2211418
197	BRUNSWICK FREIGHT LOGISTICS	NAIROBI	020-8141816
198	SPEAR LOGISTICS (K) LTD.	MOMBASA	041-2312919
199	WESTIN ENTERPRISES LTD.	MOMBASA	041-2312021
200	OKIEK ENTERPRISES LTD.	BUSIA	0716777229
201	NEO SEALAND REGIONAL FR. LTD.	NAIROBI	2241384
202	KAVFREIGHT ENTERPRISES LTD.	MOMBASA	0722424711
203	CHANNEL ATLANTIC LTD.	MOMBASA	2318139
204	CROWN INDUSTRIES LTD.	NAIROBI	020-6536876
205	BONFIDE C&f CO. LTD.	NAIROBI	020-2043220/1
206	DAVIS & SHIRTLIFF LTD.	NAIROBI	020-696800
207	UNCLE RIVERSIDE INVESTMENT LTD.	MOMBASA	0722327439
208	VILLESSY AGENCY LTD.	MOMBASA	020-3575366
209	EXCLUSIVE LOGISTICS (K) LTD.	NAIROBI	020-2211216
210	OCEANSKY CLEARING AGENCY LTD.	NAIROBI	020-2326226
211	DENALI LOGISTICS LTD.	MOMBASA	041-2315480

212	FREIGHTMAX CO. LTD.	NAIROBI	0722128128
213	JASPA FREIGHT LTD.	NAIROBI	020-2428892
214	KELVIN AND HANNINGTON INTL LTD.	NAIROBI	020-553628
215	CARMEL MOUNT FREIGHT LOGISTICS	MOMBASA	041-2224366
216	NEPTUNE FORWARDERS	NAIROBI	3004074
217	CENTRINO CARGO LTD.	MOMBASA	0721572546
218	CLEARTECH LOGISTICS LTD.	NAIROBI	0722964075
219	KENYA GENERAL INDUSTRIES LTD.	MOMBASA	0733413301
220	MTAPANGA AGENCIES LTD.	MOMBASA	2227430/1
221	EXXEM EXPRESS CARGO CO. LTD.	NAIROBI	020-2246653
222	INTL COMMERCIAL CO. (K) LTD.	NAIROBI	340741/3
223	QUISSAN ENTERPRISES LTD.	MOMBASA	041-2315504
224	SALMIR C&F CO. LTD.	MOMBASA	828264
225	AFRICAIR MANAGEMENT & LOGISTICS	NAIROBI	827536/7
226	EXCESS LUGGAGE LTD.	NAIROBI	4453321
227	HELIX LOGISTICS LTD.	NAIROBI	820391
228	UCHALE LOGISTICS LTD.	NAIROBI	0723839109
229	PORTS FREIGHT SERVICES LTD.	NAIROBI	820388
230	KIMAKIMWE LTD.	NAIROBI	820393
231	PORTS LOGISTICS LTD.	NAIROBI	820388
232	PORTS CONVEYORS LTD.	NAIROBI	820388
233	SAHA FREIGHTERS LTD.	MOMBASA	041-2317229
234	HASHI ENERGY LTD.	NAIROBI	020-2215088
235	STEEL STRUCTURES LTD.	NAIROBI	2405445/6
236	RELIANCE CARGO SERVICES	NAIROBI	0722408278
237	VIBGYOR ENTERPRISES LTD.	MOMBASA	0722881690
238	CONVEX COMMERCIAL LOGISTICS	NAIROBI	0722996537
239	GREATSPAN MARITIME SERVICES LTD.	MOMBASA	0733853734
240	GOOD FREIGHT INTERNATIONAL CO.	NAIROBI	0724610767
241	JOPUKA LOGISTICS LTD.	NAIROBI	0722669428
242	WESWORLD FR. & LOG SOLUTIONS	NAIROBI	0722856535

243	MANTRACK AGENCIES	NAIROBI	020-315902
244	KATE FREIGHT AND TRAVEL LTD.	NAIROBI	6532020
245	HORIZON FREIGHT FORWARDERS LTD.	NAIROBI	318772
246	WESTON LOGISTICS LTD.	MOMBASA	2494604
247	WATER FRONT ENTERPRISES LTD.	NAIROBI	0721241319
248	KAPRIC APPAREL LTD.	MOMBASA	020-3501690
249	TEPRA LOGISTICS LTD.	NAIROBI	
250	CHASE FAST LOGISTICS LTD.	NAIROBI	020-8047933
251	HASMAD CARGO LTD.	NAIROBI	020-310902
252	STEJA GENERAL AGENCIES CO. LTD.	MOMBASA	2222168
253	TOTAL TOUCH EXPRESS LTD.	NAIROBI	822165/4/6
254	DALSAN FREIGHTERS LTD.	MOMBASA	041-2229934
255	HOMELAND FREIGHT LTD.	NAIROBI	6537732/5
256	WAMBUKA FREIGHTERS	MOMBASA	041-2227919
257	SHARDI EXPRESS LTD.	NAIROBI	020-318329
258	AAN CLEARING & FORWARDING LTD.	MOMBASA	0733390249
259	AIRCOM CARGO LOGISTICS (K) LTD.	NAIROBI	0723951130
260	CORNERSTONE LTD.	NAIROBI	550474/5
261	GEOMWA EXPRESS CARGO LTD.	MOMBASA	041-2315942
262	TEDICE EXPRESS AGENCIES LTD.	NAIROBI	0722810754
263	MAKIWAN LOGISTICS LTD.	NAIROBI	0722794232
264	S. K. AMIN LTD.	MOMBASA	2223492
265	AEROPATH KENYA LTD.	NAIROBI	0722845578
266	UNION C & F LTD.	MOMBASA	2222913
267	PANTEL CHEMICALS LTD.	NAIROBI	0732313129
268	ALI'S FREIGHT LTD	NAIROBI	0733617229
269	SONEVA ENTERPRISES	MOMBASA	041-2226079
270	FREIGHT POINT LTD.	NAIROBI	041-2225002
271	DOSHI AND CO. HARDWARE LTD.	MOMBASA	041-2224414
272	MARACA ENTERPRISES LTD.	NAIROBI	822112
273	CAR AND GENERAL KENYA LTD.	NAIROBI	020-554500

274	INTEGRATED LOGISTICS CO.	NAIROBI	557347
275	WETSON EXPRESS	MOMBASA	0722716675
276	KODAVI INVESTMENTS LTD.	MOMBASA	0722382092
277	PAWEED EXPRESS CARGO	NAIROBI	0724283506
278	INDIAN OCEAN F. (E.A.) LTD.	MOMBASA	0727484638
279	CHINAKE INVESTMENTS LTD.	MOMBASA	041-2319726
280	EDISA HOLDINGS (K) LTD.	MOMBASA	0724700142
281	KUEHNE + NAGEL LTD.	NAIROBI	020-6600000
282	DON SIMON LTD.	MOMBASA	0722353311
283	AFFAIRES AFRIQUE LTD.	NAIROBI	827460
284	KIND LOGISTICS LTD.	MLOLONGO	0733558411
285	DUPLEX FORWARDERS LTD.	MOMBASA	020-2663985
286	CONKEN CARGO FORWARDERS LTD.	MOMBASA	0722410631
287	GLOBAL FREIGHT LOGISTICS	NAIROBI	0422204344
288	DEJAS ENTERPRISES LTD.	NAIROBI	0722731675
289	GENERAL CARGO SERVICES LTD.	MOMBASA	0735411900
290	SUFIKE INVESTMENTS LTD.	NAIROBI	0722750490
291	ALPINE TRADING LTD.	MOMBASA	041-222082
292	LAXAT TRADERS LTD.	MOMBASA	0706555577
293	AGILITY LOGISTICS LTD.	NAIROBI	020-650292
294	SPRINT FREIGHT & LOGISTICS	MOMBASA	0719316190
295	MORNING GLORY FREIGHT SERVICES	MOMBASA	041-249559
296	KIMU FREIGHT AGENCIES LTD.	MOMBASA	020-2408785
297	MOMBASA TIMES AFRICA LTD.	MOMBASA	041-2319496
298	ONE LINK LTD.	NAIROBI	020-2508861
299	LENBASE LOGISTICS LTD.	NAIROBI	0720619648
300	NAMELOK HOLDINGS LTD.	MOMBASA	0725272947
301	ALLCARGO GLOBAL LOGISTICS LTD.	NAIROBI	0722820197
302	WORLD CLASS FRIEGHT LOGISTICS	NAIROBI	020-2223782
303	DIGITAL CARGO FORWARDERS	NAIROBI	020-2404331
304	CORRUGATED SHEETS LTD.	MOMBASA	020-2023860

305	BIMA CLEARING AND FORWARDING	NAIROBI	020-318815
306	SOIN CARGO HANDLERS LTD.	MOMBASA	0722440975
307	MBARAKI PORT WAREHOUSES (K) LTD.	MOMBASA	2229062/88
308	MEADOW AGENCIES LTD.	MOMBASA	0733333180
309	BURHANI EXPRESS LOGISTICS LTD.	NAIROBI	828450/1
310	BEYOND CHANCE FREIGHT SERVICES	MOMBASA	0727283383
311	HIGHLANDS FORWARDERS LTD.	NAIROBI	020-2447428/9
312	KENUGA ENTERPRISES	MOMBASA	041-2222351
313	EXPRESS KENYA LTD.	NAIROBI	3002371/2/3
314	DUME GENERAL AGENCIES LTD.	MOMBASA	041-2222761
315	JORDAN FREIGHTERS LTD.	MOMBASA	041-2007576
316	HORIZON EXPRESS CO. LTD.	NAIROBI	559888
317	WORLD TRADE FREIGHT LOGISTICS	NAIROBI	0722798804
318	EURASIAN FREIGHT FORWARDERS	MOMBASA	041-2230298
319	RAPAT FREIGHT (K) LTD.	NAIROBI	822222/822116
320	SEASKY FREIGHT AGENCIES LTD.	NAIROBI	020-561820
321	GOHOMU AGENCIES	MOMBASA	2226836
322	HARRY CARGO FRIEGHTERS LTD.	MOMBASA	0622353536
323	RANK NETWORK LOGISTICS LTD.	MOMBASA	0720321270
324	FRAMIC CARGO AGENCIES LTD.	NAIROBI	6530048
325	BROOKEVALE INVESTMENTS LTD.	MOMBASA	
326	UNION LOGISTICS LTD.	NAIROBI	3522391/2/3
327	LITTLE LEGENDS LTD.	NAIROBI	020-2316055
328	C. K. ROTTUK LTD.	MOMBASA	0706331441
329	LIBERTY FREIGHTERS LTD.	NAIROBI	020-2217232
330	SOLSON CLEARING CO.	MOMBASA	2490963
331	MARK RIECH AFRICA LIMITED	MOMBASA	2222719
332	DAMCO LOGISTICS K LIMITED	NAIROBI	828876/8
333	PRIORITY AIR EXPRESS LIMITED	NAIROBI	0736748195
334	JAMBO TRADERS LIMITED	MOMBASA	0412317166
335	GAMMA VILLA LIMITED	NAIROBI	828276/8

336	AIRFLO LIMITED	NAIROBI	66082562
337	PERLES SOLUTIONS	MOMBASA	041-2317064
338	SKYTRAIN LIMITED	NAIROBI	822038/822039
339	WANSAR KENYA LIMITED	NAIROBI	020780858
340	SMOOTHLINE FREIGHTERS LIMITED	NAIROBI	0722303143
341	SITE FORWARDERS LIMITED	NAIROBI	2247596
342	KAMPALA JUBA FREIGHTERS LIMITED	MOMBASA	041-2319170
343	INSTA PRODUCTS EPZ LIMITED	NAIROBI	045-22961/2
344	KENTON FREIGHTERS	NAIROBI	020-2362255
345	DELFAST LOGISTICS LTD.	NAIROBI	0724253060
346	SAMBA ENTERPRISES LTD.	MOMBASA	041-2414491
347	KENSCO BUSINESS SOLUTIONS LTD.	NAIROBI	2240498
348	WAKI C&F AGENTS LTD.	NAIROBI	3561622
349	SALIMOND FREIGHT SERVICES LTD.	NAIROBI	2251014/224088
350	LOGISTICS FREIGHT LTD.	NAIROBI	2246097
351	APPROVED LOGISTICS LTD.	MOMBASA	0722650326
352	ALTCO LOGISTICS LTD.	LOKICHOGGIO	0722381076
353	LABORATORY & ALLIED LTD.	NAIROBI	8040306
354	PRIORITY LOGISTICS LTD.	NAIROBI	020-3565281
355	FOCUS INITIATIVE IMP & EXPORT CO.	NAIROBI	020-310468
356	BULE & SONS FREIGHT SERVICES	NAIROBI	020-3575460
357	LEIGHNICKS CO. LTD.	NAIROBI	020-2219873
358	GEMINI TRADING CO. LTD.	MOMBASA	2311983/4
359	SAFREIGHT LTD.	MOMBASA	4470802
360	ECS LOGISTICS (K) LTD.	MOMBASA	2225801
361	OCEANIC CARGO AGENCY	NAIROBI	2162516
362	PRIMCARGO AGENCIES LTD.	NAIROBI	2247122
363	PLUMASON CO. TD.	MOMBASA	2228001
364	KENYA AIRFORCE	NAIROBI	0727901988
365	FREIGHT REACH SERVICES LTD.	NAIROBI	020-2650301
366	BROADWAY EXPRESS LTD.	NAIROBI	0733241888

367	PAN AFRICAN SYNDICATE LTD.	MOMBASA	2312123/4/5
368	IMPEX FREIGHT LTD.	NAIROBI	020-342179
369	MISHALE FREIGHTERS LTD.	NAIROBI	020-555495
370	GARDEN FREIGHT LOGISTICS LTD.	NAIROBI	
371	BARENA E.A. LTD.	NAIROBI	2685102
372	BUHAYRAH FREIGHTS LTD.	NAIROBI	0722328140
373	LAMU LOGISTICS CO. LTD.	MOMBASA	041-2008484
374	TOPLINE LOGISTICS LTD.	NAIROBI	312430
375	BLUE STAR CARGO LTD	NAIROBI	0721201133
376	INDUS LOGISTICS LTD.	MOMBASA	0708774747
377	ADMIDO AGENCIES LTD.	NAIROBI	020-2636292
378	HASS PETROLEUM KENYA LTD.	NAIROBI	2760000
379	MAK CARGO HANDLING SERVICES	MOMBASA	020-3549036
380	SHARAF LOGISTICS LTD.	MOMBASA	041-2319365
381	BLUE STAR TOURS INTERNATIONAL	MOMBASA	0720260800
382	ADELCUS AGENCIES (K) LTD.	MOMBASA	0723303177
383	YEAR 2000 FREIGHTERS LTD.	NAIROBI	3746466/8
384	DAVELINE NETWORK CO. LTD.	MOMBASA	020-2054219
385	BARGAABA BUSINESS AGENCY	NAIROBI	053-8010544
386	SEALINE FORWARDERS LTD.	MOMBASA	041-2224429
387	AL-EMIR LTD.	MOMBASA	2226830
388	DORIC ENTERPRISES LTD.	NAIROBI	020-2422912
389	FREIGHT POWER LOGISTICS LTD.	NAIROBI	020-8144120
390	WESTWINDS FREIGHT SERVICES LTD.	NAIROBI	0721559589
391	MARITIME FREIGHT CO. LTD.	MOMBASA	2220075/2226813
392	INTRASPAX FREIGHTERS	NAIROBI	020-2219280
393	TUDOR SERVICES LTD.	MOMBASA	041-2220849
394	EXPORT TRADING CO. LTD.	NAIROBI	020-2860881
395	JAMKA AGENCIES LTD.	NAIROBI	0722914865
396	SAHARRY LTD.	NAIROBI	0721600010
397	BOGANI FREIGHT SERVICES LTD.	NAIROBI	051-8006752

398	CONTINENTAL FREIGHTERS LTD.	NAIROBI	2218619
399	CONTINENTAL LOGISTICS NETWORKS	NAIROBI	2713018
400	MEPRO TRADE LTD.	NAIROBI	
401	ZANAA FREIGHT LTD.	NAIROBI	
402	FLOWERWINGS EXPRESS (K) LTD.	NAIROBI	020-722777/8/9
403	TASTIC ENTERPRISES	NAIROBI	020-554524
404	DIVERSE MARINE & AIR C&F SERVICES	MOMBASA	041-2226272
405	GALAXY LOGISTICS LTD.	MOMBASA	0720573677
406	DEL RAY CARGO SERVICES LTD.	NAIROBI	224656
407	TRANSCARE SERVICES LTD.	NAIROBI	020-827279
408	SEACROSS FREIGHTERS (EA) LTD.	MOMBASA	0734411460
409	MULTICARGO FREIGHTERS	MOMBASA	041-2319811
410	CASCADE SWIFT E.A. AGENCY LTD.	MOMBASA	0724131289
411	RAYTEC ENTERPRISES LTD.	NAIROBI	0724241888
412	AIR-WAGON CARGO MOVERS LTD.	NAIROBI	020-828146
413	ARNOP LOGISTICS CO. LTD.	MOMBASA	0721520120
414	DHL GLOBAL FORWARDING (K) LTD.	NAIROBI	020-6925800
415	DAVKIT ENTERPRISES LTD.	MOMBASA	0712228338
416	PILLAR FREIGHT FORWARDERS LTD.	NAIROBI	020-2302627
417	MAKAMA ADVANCED LOGISTICS LTD.	NAIROBI	0722849909
418	AIRFREIGHT & LOG WORLDWIDE LTD.	NAIROBI	0722707904
419	MID AFRICA SERVICES LTD.	NAIROBI	0722498644
420	SWIFT GLOBAL LOGISTICS LTD.	MOMBASA	2224865/2311351
421	KAWAISON INTERNATIONAL LTD.	NAIROBI	020-311052/3
422	ABBAS TRADERS LTD.	MOMBASA	2316699
423	AGRIQUIP AGENCIES E.A. LTD.	NAIROBI	652107/9
424	VASTERGUARD TRADING CO. LTD.	NAIROBI	2212999
425	TRANSVAAL LOGISTICS LTD.	MOMBASA	041-2002772
426	MANUFACTURERS & SUPPLIERS LTD.	NAIROBI	554199
427	ABSOLUTE FR. SERVICES & LOGISTICS	MOMBASA	
428	FREVA LOGISTICS SERVICES	NAIROBI	0722701614



429	SAHARA INTERNATIONAL LOGISTICS	MOMBASA	041-2319954
430	GN CARGO KENYA LTD.	NAIROBI	202311
431	STEMI INVESTMENT LTD.	MOMBASA	041-2227514
432	SKY LINE GLOBAL SERVICES LTD.	NAIROBI	2240017
433	CARGO WORLD CONVEYORSS LTD.	NAIROBI	
434	VIBRASI ENTERPRISES LTD.	MOMBASA	0722426597
435	LAS AIRFREIGHT LTD.	MOMBASA	0713424150
436	SEABASE SOLUTIONS LTD.	MOMBASA	041-2222329
437	FREIGHT OPTIONS & SOLUTIONS	NAIROBI	020-2011232
438	REALTIME LOGISTICS LTD.	NAIROBI	0732910520
439	BEACON MOVERS (K) LTD.	NAIROBI	020-2017075
440	RISING FREIGHT LTD.	NAIROBI	820905/820906
441	RUATECH GLOBAL LOGISTICS LTD.	NAIROBI	020-2011232
442	LIVERCOT IMPEX LTD.	MOMBASA	2315635
443	TANDEM FREIGHT SERVICES LTD.	MOMBASA	041-2319259
444	AL ASEEF IMPES LTD.	MOMBASA	0722415202
445	ESTON DIAMOND LOGISTICS LTD.	NAIROBI	020-4442394
446	ASHTON APPAREL EPZ LTD.	MOMBASA	3434251
447	BESTFAST CARGO (K) LTD.	NAIROBI	3540453/4
448	AL YUM HAULIERS LTD.	MOMBASA	020-2107159
449	EXP CONSOLIDATION SERVICES (K)	MOMBASA	2225801
450	HILLCONS ENTERPRISES CO.	MOMBASA	0755661616
451	TRADEWINDS LOGISTICS LTD.	NAIROBI	822866
452	MATSINGBERG C&F LTD.	NAIROBI	
453	REGENT FREIGHT SYSTEMS LTD.	NAIROBI	0722565444
454	ALCORDIA LOGISTICS LTD.	MOMBASA	0735673738
455	SEABRIDGE FORWARDERS LTD.	MOMBASA	828753/4
456	DHANUSH FORWARDERS (K) LTD.	MOMBASA	041-231654/5
457	TRANSPORT & LIFTING SERVICES LTD.	NAIROBI	554822
458	SMELRALDO INVESTMENTS LTD.	NAIROBI	020-31100
459	FEEDERLINK LOGISTICS LTD.	MOMBASA	041-2223166

460	UMOJA RUBBER PRODUCTS LTD.	MOMBASA	2224630/2228536
461	FASTLANE FREIGHT FORWARDERS	NAIROBI	020-2457835
462	MARK ENTERPRISES LTD.	NAIROBI	6000855
463	INTER PLANET C&F CO. LTD.	MOMBASA	0722701824
464	AEROMARINE CARGO SERVICES LTD.	MOMBASA	041-2222979
465	HEME FREIGHTERS	MOMBASA	0722276499
466	EAST AFRICA CARGO LOGISTICS	MOMBASA	041-2230213
467	UFANISI FREIGHTERS (K) LTD.	MOMBASA	2225889
468	UNICON LOGISTICS	NAIROBI	2245916
469	ICEBERG MOVERS ENTERPRISES	NAIROBI	0722944456
470	INTL COMMODITY & FREIGHT CENTRE	NAIROBI	312840
471	NNITO TRADING LTD.	NAIROBI	020-2333107
472	LONGROCK ENGINEERING LTD.	NAIROBI	38572278
473	CARGOCARE INTERNATIONAL LTD.	NAIROBI	020-3517871
474	FOURSEAS CARGO LTD	NAIROBI	020-2014652
475	HOMELINE CONSOLIDATION SERVICES	MOMBASA	0721446329
476	SCHENKER LTD.	NAIROBI	827240/827241
477	FREIGHTLOGIX KENYA LTD.	NAIROBI	0202381160-2
478	ECHKEN AGENCIES	MOMBASA	020-2408536
479	MAREBA EXPRESS CARGO	NAIROBI	0720752255
480	G4S SECURITY SERVICES (K) LTD.	NAIROBI	020-6982000
481	AGS WORLDWIDE MOVERS LTD.	MOMBASA	0770513186
482	DHL WORLDWIDE EXPRESS	NAIROBI	020-6925100
483	FELICLEARCON CO. LTD.	NAIROBI	07227524308
484	MULTIPLE SOLUTIONS LTD.	NAIROBI	020-8008809
485	KADMUS FREIGHT LOGIDTICS LTD	MOMBASA	0722838219
486	SKYWAYS LOGISTICS LTD.	NAIROBI	0720206745
487	OCEAN PACIFIC INTL LINES	MOMBASA	2226888
488	ABBEZ TRADING CO. LTD.	MOMBASA	041-2319121/2
489	KENYA VEHICLE MANUFACTURERS	THIKA	020-2357736
490	SOUTHERN SHIPPING SERVICES LTD.	MOMBASA	2227232

491	CARGODECK (EA) LTD.	MOMBASA	2314228
492	CHWILE INVESTMENTS LTD.	MOMBASA	041-2319206
493	THAKA LTD.	NAIROBI	4453793/4
494	OASIS CARGO LOGISTICS LTD.	MOMBASA	0721736132
495	TIBA FREIGHT FORWARDERS LTD.	MOMBASA	041-2229934
496	CHASAH LOGISTICS LTD.	MOMBASA	0724954322
497	BAHARI TRANSPORT CO. LTD.	MOMBASA	041-2225063
498	MANAQUIM CARGO CO. LTD.	NAIROBI	020-558844
499	GIRAFFEE FORWARDERS LTD.	NAIROBI	
500	KENREVVY CARGO CONVEYORS	MOMBASA	041-2315706
501	RUMAN LOGISTICS	NAIROBI	020-558844
502	NAJMI CLEARING & FORWADING	MOMBASA	2223728/2230343
503	JIHAN FREIGHTERS LTD.	MOMBASA	2223939/2227093
504	THE MAIN MARITIME SHIPPING LTD.	MOMBASA	0726816725
505	EURO ONE KENYA	NAIROBI	4444696
506	CHAISSO AGENCIES LTD.	MOMBASA	041-2317117
507	CATESAM ENT. LTD.	NAIROBI	020-2416555
508	DRENAL ENTERPRISES LTD.	MOMBASA	020-2151258
509	SMART TRADERS LTD.	MOMBASA	0733996663
510	SWIFTLINK FREIGHT SERVICES LTD.	NAIROBI	020-827194
511	INLAND AFRICA LOGISTICS LTD.	MOMBASA	041-2317647
512	ATLANTIC LOGISTICS INTERNATIONAL	NAIROBI	0716216730
513	JOHN FLORENCE MARITIME SERVICES	MOMBASA	020-2615905
514	ROSMIK TRADING CO. LTD.	MOMBASA	0722343630
515	LYCHEEWOOD LTD.	MOMBASA	0733996663
516	AINUSHAMSI MULTIPLE AGENCIES	NAIROBI	2469210/9
517	SOKOTA INVESTMENTS LTD.	MOMBASA	0720959061
518	KITAKA ENTERPRISES LTD.	MOMBASA	0723178712
519	CHEBE FREIGHTERS LTD.	MOMBASA	2222670
520	SHIPFREIGHT LOGISTICS LTD	MOMBASA	0722106392
521	MIDLANDS FREIGHT LTD.	NAIROBI	2318233

522	COASTLINE AGENCIES	MOMBASA	0729898481
523	EMICA LOGISTICS LTD.	NAIROBI	0711905541
524	MULTILINES INTERNATIONAL (K) LTD.	NAIROBI	0204440815
525	ASP COMPANY LTD.	NAIROBI	020-3533974
526	FERIDA ENTERPRISES LTD.	MOMBASA	041-2317248
527	MORGAN AIR CARGO LTD.	NAIROBI	827136
528	BIGTIMER AGENCIES LTD.	NAIROBI	0722526327
529	BAYLAND FREIGHT AGENCIES LTD.	MOMBASA	2314692
530	GHOMBA INTERNATIONAL AGENCIES	NAIROBI	020-2340288
531	TRADEWINDS INTERNATIONAL CARGO	NAIROBI	020-8163860/1/2
532	KAKSINGRI FREIGHT DEVELOPMENT	MOMBASA	2199170
533	ZEFT FREIGHTERS	NAIROBI	6760535
534	KIBS INVESTMENT LTD.	ISEBANIA	0721718747
535	FERDINARD FREIGHT & FORWARDERS	NAIROBI	0722139650
536	BIRDWELL VENTURES LTD.	NAIROBI	0672922
537	KEYNOTE LOGISTICS LTD.	NAIROBI	020-2240549
538	EAST MERCHANTS LOGISTICS	NAIROBI	0724576334
539	MASCOT HOLDINGS LTD.	NAIROBI	020-2662735
540	RAY-CARGO SERVICES LTD.	NAIROBI	2247302
541	TECHFREIGHT LOGISTICS LTD.	NAIROBI	327323
542	LOGISTICS SOLUTIONS CO. LTD.	NAIROBI	041-2318090
543	MFANCO AGENCIES LTD.	NAIROBI	041-2220617
544	JUWELLS TRADING CO. LTD.	MOMBASA	041-2319937
545	SHIPSIDES & GENERAL SERVICES LTD.	MOMBASA	710610050
546	TOPEN INDUSTRIES LTD.	NAIROBI	555101
547	RAPID KATE SERVICES LTD.	NAIROBI	0735600117
548	BLUESHED FREIGHTERS LTD.	MOMBASA	0722275463
549	EFFECTIVE CARGO CONSOLIDATOR	NAIROBI	2220403
550	MUHITO INVESTMENTS	MOMBASA	041-2317237
551	MOLO FREIGHTERS LTD.	MOMBASA	0722283535
552	MIDWAVE FREIGHTERS LTD.	NAIROBI	020-650365/4

553	FORA LTD.	MOMBASA	041-2313350
554	RORENE LTD.	MOMBASA	0722733384
555	MUSTHAFI ENTERPRISES LTD.	MOMBASA	2223293
556	DELMONTE (K) LTD.	THIKA	020-2141600
557	THOR SERVICES LTD.	NAIROBI	0728646735
558	DODHIA PACKAGING LTD.	NAIROBI	5005530/1/2/3
559	CARGO POINT INTERNATIONAL LTD.	NAIROBI	020-35665597
560	STAR RHODE CO. LTD.	NAIROBI	722997507
561	INVESCO CARGO SOLUTIONS LTD.	NAIROBI	020-2248290
562	CHERSHIRE FREIGHT LTD.	NAIROBI	020-2062761
563	MUCHEBA SERVICES	MALABA	0722551122
564	CONTINENTAL CARGO SERVICES (K)	NAIROBI	0722319201
565	KENYA HAULAGE AGENCY LTD.	MOMBASA	0723107479
566	GEORINE AGENCIES LTD.	MOMBASA	041-226308
567	NEOSERVE LOGISTICS LTD.	NAIROBI	020-246329
568	HI SPEED FREIGHT SERVICES LTD.	NAIROBI	020-827549
569	ROYAL ENERGY (K) LTD.	MOMBASA	0729410780
570	NODOR KENYA EPZ LTD.	ATHI RIVER	045-662292
571	JEDIMA TRADE AGENCIES LTD.	NAIROBI	2014365
572	WILLING FREIGHT SERVICES LTD.	NAIROBI	020-2394387
573	CONTILOGIC FORWARDERS LTD.	NAIROBI	0723442867
574	NARCOL ALLUMINIUM ROLLING MILLS	MOMBASA	2226317
575	ALFOST ENTERPRISES LTD.	MOMBASA	041-2318339/40
576	REFCO FORWARDERS LTD.	MOMBASA	2221070
577	LIFTCARGO LTD.	NAIROBI	020-822035
578	LINO STATIONERS (K) LTD.	NAIROBI	0722202136
579	LOGISTICS THREE SIXTY FIVE LTD.	MOMBASA	020-2616211/12
580	SIGINON FREIGHT LTD.	MOMBASA	041-2314150
581	UNDERSEAS MERCHANTS	NAIROBI	020-2351987
582	BEDI INVESTMENTS LTD.	NAKURU	051-2212320/1/2
583	JEMI FREIGHT LTD.	NAIROBI	020-2301551

584	PEJON FREIGHT MOVERS LTD.	NAIROBI	020-3592750
585	KENMONT LOGISTICS LTD.	MOMBASA	041-2319751
586	JAMKELL ENTERPRISES LTD.	MOMBASA	041-2314492
587	NEW PLANET EXPRESS LTD.	NAIROBI	020-2010504
588	PLAN FREIGHT LTD.	NAIROBI	2222344/2222355
589	BATA SHOE CO. (K) LTD.	LIMURU	020-2010620
590	GLOBAL ALLIANCE CONSULTANCY	NAIROBI	0722766836
591	REJEIBY CLEARING & FORWARDING	MOMBASA	0722410229
592	LOGISTICS LINK LTD.	NAIROBI	0736262126
593	RUBY CLEARING & FORWARDING	MOMBASA	0722567160
594	SANDEK AGENCIES LTD.	MOMBASA	041-2223984
595	ALIMANN LOGISTICS LTD.	MOMBASA	0711904408
596	CONSTANCE FREIGHT SERVICES	NAIROBI	020-2244433
597	AL SHOG SYSTEMS LTD.	MOMBASA	0714868484
598	WAY TO ASSOCIATES LTD.	MOMBASA	041-2317277
599	JACKA AGENCIES	NAIROBI	2224447
600	BESTFREIGHT CONVEYORS LTD.	NAIROBI	3749400
601	TRADE BASE CO. LTD.	NAIROBI	2348152
602	LINKAGE CONVEYORS LTD.	MOMBASA	041-2223107
603	DALEXY FREIGHTERS LTD.	NAIROBI	0725357578
604	TRANSLINK LOGISTICS LTD.	MOMBASA	020-3561777
605	FEELS TIME COMPANY LTD.	MOMBASA	041-2319318
606	AZUSA LTD.	NAIROBI	311911
607	LIDAN ENTERPRISES LTD.	MOMBASA	041-2221925
608	HOLLYWOOD FREIGHT AGENCIES LTD.	NAIROBI	020-313775
609	LEMCO FREIGHT FROWARDERS LTD.	NAIROBI	020-7123279
610	FOAM MATTRESS LTD.	KISUMU	057-2024940/1
611	PREMIER FLOUR MILLS LTD.	NAIROBI	6531313
612	PETRUT FREIGHT FORWARDERS LTD.	MOMBASA	041-2223368
613	MARYMAC FREIGHT CO.	MOMBASA	2229185
614	BRYSON EXPRESS LTD.	MOMBASA	0722435040

615	BOSMAR C&F ENTERPRISES LTD.	NAIROBI	020-2212906
616	FELIBEN INTERNATIONAL LTD.	NAIROBI	3007475
617	DELACOM SERVICES CO. LTD.	NAIROBI	020-2696300
618	CROSS OCEAN LTD.	NAIROBI	020-2023046
619	PENTAGON LOGISTICS LTD.	NAIROBI	020-2114023
620	ECU LINE KENYA LTD.	MOMBASA	041-2311563
621	EMPIRE LOGISTICS SERVICES LTD.	NAIROBI	020-652372
622	JOMWAKI CARGO SERVICES LTD.	NAIROBI	0722899493
623	TRANSVISTA FREIGHT LTD.	NAIROBI	2343540
624	PAK PACIFIC LTD.	MOMBASA	0722827918
625	SKYMAN FREIGHTERS LTD.	MOMBASA	0722873185
626	NICAH LOGISTICS	MOMBASA	0733331081
627	AWAYTO EAST AFRICA FR. LOGISTICS	NAIROBI	020-2261344/5
628	SAMPHY LOGISTICS SERVICES	NAIROBI	0724542614
629	ADAIR FREIGHT SERVICES LTD.	NAIROBI	827496/827912
630	GOLDEN SPARROW FREIGHTERS LTD.	NAIROBI	0722336502
631	KANKAM EXPORTERS LTD.	NAIROBI	020-2391213
632	WIGGLESWORTH EXPORTERS LTD.	MOMBASA	2225244/2220642
633	ELMON AGENCIES	MOMBASA	0723814181
634	GIFCO KENYA LTD.	MOMBASA	
635	MILESTONE IMPORT & EXPORT LTD.	NAIROBI	0204180482
636	BENAIRS LOGISTICS LTD.	NAIROBI	020-2385329
637	QUEENS CARGO INTERNATIONAL LTD.	NAIROBI	020-559472
638	SEAGATE LOGISTICS LTD.	MOMBASA	0722632292
639	MOMBASA COFEE LTD.	MOMBASA	041-2312948/9
640	BENELI FREIGHTERS LTD.	MOMBASA	
641	ROTO MOULDERS LTD.	NAIROBI	020-3507850
642	MILLEAGE ENTERPRISES LTD.	NAIROBI	020-2044839/41
643	AMAZON FREIGHT LTD.	NAIROBI	2056494
644	INCOTERMS LOGISTICS SOLUTIONS (K)	MOMBASA	0722735475
645	GENERAL MOTORS E.A. LTD.	NAIROBI	020-6936111

646	PAN AFRIQUE FORWARDERS LTD.	MOMBASA	041-2228984
647	PHILSAM AGENCIES LTD.	NAIROBI	343749/343978
648	UNITED FREIGHT LOGISTICS	NAIROBI	822829
649	SYLLER IMPRESS CO. LTD.	MOMBASA	2319707
650	SOPA CARGO SERVICES LTD.	NAIROBI	020-2158061
651	RAI PLYWOOD (K) LTD.	ELDORET	053-2062222
652	KELIMA FORWARDERS LTD.	KAMURIAI	0724264110
653	RAMSFORD FREIGHT FORWARDERS	NAIROBI	020-2663417
654	GATEWAY MARINE SERVICES LTD.	MOMBASA	0716430902
655	LOW SEA INTERNATIONAL AGENCIES	MOMBASA	041-2225444
656	VID FREIGHTERS LTD.	NAIROBI	020-2517095/6
657	SPART FREIGHT LOGISTICS LTD.	MOMBASA	041-2317079
658	CARJET KENYA LTD.	NAIROBI	310932
659	PALM FREIGHTERS LTD.	MOMBASA	041-2314098
660	LIMUTTI HOLDINGS LTD.	MOMBASA	2222238
661	BEYOND AFRICA FREIGHTERS LTD.	NAIROBI	020-2728327/9
662	DELTA EXPRESS	MOMBASA	0725278125
663	JOSIM AGENCIES LTD.	MOMBASA	0722537085
664	JAGOMA LOGISTICS LTD.	MOMBASA	041-2225552
665	THAM EXPRESS LTD.	NAIROBI	020-3500866
666	SUMMIT COVE LINES CO. LTD.	MOMBASA	020-3501248
667	REALTIME CARGO LTD.	NAIROBI	020-2015735
668	RIDGEWAYS MERCHANTS LTD.	NAIROBI	020-311830
669	UNITED ARYAN EPZ LTD.	NAIROBI	2396197/8
670	KEARSLEY FREIGHT SERVICES LTD.	NAIROBI	0735-202456
671	NEW WAY INTL FORWARDERS	MOMBASA	041-2319690
672	BEST WING CARGO LTD.	NAIROBI	020-827388
673	BEACH LINES LTD.	NAIROBI	4185053
674	PEERLESS TEA SERVICES LTD.	MOMBASA	2221396
675	RYCE EAST AFRICA LTD.	NAIROBI	6531786/6
676	GEOTROMAC AGENCIES LTD.	NAIROBI	0722694193



677	MARICHOR MARKETING SERVICES	ELDORET	053-2062804
678	ALIBHAI RAMJI (MSA) LTD.	MOMBASA	224702
679	CHAI WAREHOUSING LTD.	MOMBASA	020-2033676
680	CEBIT CARGO LTD.	NAIROBI	020-8076812
681	MUNSHIRAM INTL BUS MACHINES	NAIROBI	532323/4
682	QUICKSAVE AGENCIES LTD.	NAIROBI	
683	WARTON AGENCIES LTD.	NAIROBI	0722799339
684	BARKI INTERNATIONAL ENERGY (K)	NAIROBI	2730003/8/9
685	ACTIVE CARGO SERVICES LTD.	MOMBASA	0722603071
686	TURNER FREIGHT LTD.	MOMBASA	0712480641
687	FAST CARGO MASTERS (K) LTD.	MOMBASA	041-2318709
688	EAST AFRICAN CHAINS LTD.	NAIROBI	6531376/9
689	NEXUS QUICK SERVICES	NAIROBI	0720707948
690	PAN AFRICA LOGISTICS LTD.	MOMBASA	041-2319715/6
691	ALPHA IMPEX LOGISTICS	NAIROBI	827828
692	MRIS AGENCIES LTD.	NAIROBI	
693	CERTIS CO. LTD.	NAIROBI	020-312433
694	GREEN ISLAND SHIPCHANDLERS (K)	MOMBASA	2222993/2311096
695	LINKON INVESTMENTS LTD.	NAIROBI	020-8098292
696	MAGNEX LTD.	MOMBASA	041-2311521
697	AIR GO CONSULTANTS LTD.	NAIROBI	827077
698	ALPHA LOGISTICS (K) LTD.	NAIROBI	825481
699	MITCHELL COTTS FREIGHT (K) LTD.	MOMBASA	2225509/2315780
700	KINGS CARGO AGENTS LTD	NAIROBI	0724311639
701	INSPIRE AFRICA LOGISTICS LTD.	MOMBASA	0720256762
702	IMPEX LOGISTICS LTD.	MOMBASA	0729393200
703	BAYONNE FREIGHT FORWARDERS	MOMBASA	0722221736
704	AL-ITIGAN INVESTMENTS CO. LTD.	MOMBASA	020-2038689
705	VEROM C&F CO. LTD.	MOMBASA	0720839414
706	PORTWAY (EA) LTD.	NAIROBI	0728577770
707	NAFNET LOGISTICS LTD.	NAIROBI	0722326332

708	ARCHIECRAFT HOLDINGS LTD.	MOMBASA	020-25993472
709	INTERPORT CLEARING SERVICES LTD.	NAIROBI	
710	INTERKEN ENTERPRISES LTD.	NAIROBI	020-2107133
711	SEALAIR FREIGHT LTD.	NAIROBI	2250954
712	SAA INTERSTATE TRADERS (K) LTD.	MOMBASA	020-2038689
713	CAMDEL EXPORT & IMPORT	NAIROBI	313383
714	BLUE PLUS TEXTILES LTD.	NAIROBI	0713765571
715	FORESTER FORWARDERS	NAIROBI	0722637578
716	OPTIMAX AGENCIES LTD.	NAIROBI	828115
717	SAHEL FREIGHTERS LTD.	MOMBASA	2226089
718	MTUDAWA FREIGHTERS LTD.	MOMBASA	041-2319493
719	FREIGHTCARE LOGISTICS LTD.	MOMBASA	0722798036
720	ALEXANDRIA FREIGHT FORWARDERS	NAIROBI	2243542
721	VICTORIA INTERNATIONAL LOGISTICS	NAIROBI	020-551142
722	KESA LOGISTICS LTD.	MOMBASA	0733136000
723	VICTORY FREIGHT SERVICES	MOMBASA	041-2225708
724	QUICK CARGO SERVICES	NAIROBI	020-552372
725	TECHNO RELIEF SERVICES LTD.	NAIROBI	0722200539
726	EXPOLANKA FREIGHT LTD.	NAIROBI	020-2437861/2
727	CORONET CARGO LTD.	NAIROBI	2240485
728	PESOSI FREIGHTERS LTD.	MOMBASA	2220966
729	OCEAN STAR GENERAL AGENTS LTD.	MOMBASA	0720864475
730	EAST GLOBAL LOGISTICS (K) LTD.	MOMBASA	0722224629
731	BELL LOGISTICS SERVICES	NAIROBI	020-3588901
732	SPERANZA INTERNATIONAL LTD.	NAIROBI	0721739329
733	NATALYA HOLDINGS CO. LTD.	MOMBASA	2222832
734	GRACE REMOVALS LTD.	NAIROBI	020-2062844
735	WORLDNET FREIGHT LTD.	NAIROBI	020-2107081
736	DELTA HANDLING SERVICES LTD.	NAIROBI	0722870187
737	REMOVAL GOODS SERVICES (K) LTD.	NAIROBI	020-8067416
738	KEIHIN MARITIME SERVICES	MOMBASA	041-2230349

739	SABINA LOGISTICS LTD.	MOMBASA	041-2227832
740	AIRBAND CARGO FORWARDERS LTD.	NAIROBI	020-2218468
741	DANSAF LOGISTICS LTD.	NAIROBI	0722773598
742	SEAWAYS KENYA LTD.	NAIROBI	3872660
743	RUFAIDA ENTERPRISES	MOMBASA	0722727312
744	SAM AND SAN LOGISTICS	NAKURU	0721967212
745	CARGOMAX FREIGHTERS LTD.	MOMBASA	0722637021
746	KENYA WINE AGENCIES	NAIROBI	020-4979000
747	KIPTEBEE FREIGHTERS LTD	MOMBASA	0722856605
748	SYNERGY FREIGHT & LOGISTICS LTD.	MOMBASA	020-261241
749	ZAHA LOGISTICS LTD.	MOMBASA	0720214434
750	LOGENIX INTERNATIONAL LTD.	NAIROBI	2218249
751	INTERGRID BUSINESS SOLUTIONS LTD.	NAIROBI	020-6829226
752	ALOYS AND ROY FREIGHT SYSTEM	NAIROBI	020-318950
753	MESHARRY FREIGHT FORWARDERS	NAIROBI	
754	TOTAL PLUS BUREAU CO. LTD.	NAIROBI	827673
755	SWIFT ROYAL CONVEYORS	MOMBASA	041-2230470
756	DIFAM FREIGHT LTD.	BUSIA	05522127
757	GOODMAN INTERNATIONAL LTD.	NAIROBI	4446684/85/86
758	INTIME FR & CARGO SERVICES CO.	NAIROBI	0722300685
759	CARGOWORX KENYA LTD.	NAIROBI	828069
760	KEVIAN KENYA LTD.	NAIROBI	020-3870375
761	GOSHEN INTERNATIONAL LTD.	MOMBASA	
762	KIMCLEAR ENTERPRISES	NAIROBI	827673
763	WISEWAY FREIGHTERS LTD.	NAIROBI	020-3589639
764	TRANSNORTH LOGISTICS LTD.	MOMBASA	0729393200
765	BAYPORT FREIGHTERS	NAIROBI	0722834326
766	COAST SEABED FREIGHTERS	MOMBASA	0722796179
767	INTERCITIES FREIGHT & SHIPPING LTD.	NAIROBI	343483
768	SHREEJI FORWARDERS LTD.	NAIROBI	6824152
769	BLUE SEAL FREIGHTERS	NAIROBI	

770	DAHLA KENYA LTD.	MOMBASA	041-231738/39
771	WESTERN LOGISTICS SERVICES	NAIROBI	828449/50
772	M.J. CLARKE LTD.	MOMBASA	2226114
773	BLACKBOX (K) LTD	MOMBASA	0727658648
774	SISCO SUPERIOR CAR HANDLING	NAIROBI	020-249131
775	FLEET FREIGHTERS	NAIROBI	2216167
776	GREAT ANCHOR CARGO LTD.	NAIROBI	828161
777	WETAA INVESTMENTS LTD.	MOMBASA	041-225584
778	THE NAIROBI CLEARING HOUSE (EA)	NAIROBI	020-2363159
779	NORTH WEST (K) LTD.	MOMBASA	041-2313978
780	BLUE WAVES LOGISTICS LTD.	NAIROBI	0736600133
781	DODWELL AND CO. (E.A.) LTD.	MOMBASA	2230060
782	TIMSALES LTD.	NAIROBI	6532277
783	RISALA LTD.	MOMBASA	2223815/25
784	SOLLATEK ELECTRONICS (K) LTD.	MOMBASA	020-3501671/2
785	SAI CARGO MASTERS LTD.	NAIROBI	0722890056
786	LANSEAIR LTD.	NAIROBI	020-6004272
787	P. N. MASHRU LTD.	MOMBASA	020-2040526/7
788	LOGISTICS SERVICES LTD.	MOMBASA	0731104149
789	ARMCO (K) LTD.	NAIROBI	4444628
790	CRUCIAL CARGO MOVERS	NAIROBI	22441104
791	ANKIN COMMERCIAL AGENCY	MOMBASA	0729972509
792	MILLENIU AVAITION SERVICES	MOMBASA	2230387
793	AMER TRADERS LTD.	MOMBASA	0713288651
794	GIMBO FREIGHT LTD.	NAIROBI	0722691280
795	PATANA ENTERPRISES LTD.	MOMBASA	0721240557
796	QUATAR FREIGHT LOGISTICS	NAIROBI	0710682221
797	KENYA GRANGE VEHICLE INDUSTRIES	NAIROBI	3914000
798	MNET STARS LTD.	MOMBASA	020-8008966
799	PEARL LOGISTICS LTD.	KAMURIAI	055-54010
800	INTERNATIONAL FOREIGN TRADE CO.	NAIROBI	4443977

801	TABAKI FREIGHT SERVICES LTD.	NAIROBI	020-2459575
802	OCEAN HARVEST AND LOGISTICS LTD.	MOMBASA	2225038
803	COLOSSUS FREIGHT LTD.	MOMBASA	0720292835
804	CARGO FRONT INTERNATIONAL LTD.	NAIROBI	
805	UNITED (E.A.) WAREHOUSES LTD.	MOMBASA	2315744
806	LANDMARK FREIGHT SERVICES LTD.	NAIROBI	0724610767
807	OCEANLINE FREIGHT FORWARDERS	NAIROBI	533482/555761
808	SEAGATE FREIGHTERS LTD.	MOMBASA	041-2224973
809	KENYA AIRWAYS LTD.	NAIROBI	6423156/3240
810	ZOUNHAIZE (K)	NAIROBI	
811	RUKEN FREIGHT LTD.	NAIROBI	0722840694
812	DESTINY FR HANDLING P & CLEARING SERVICES	NAIROBI	0722880556
813	BRIDGECO INTERNATIONAL LTD.	NAIROBI	0722880556
814	JUATECH AGENCIES	NAIROBI	020-6002625
815	STRAIGHT LINE CARGO FORWARDERS	NAIROBI	020-2018537/8
816	JAMES FINLAY MOMBASA LTD.	MOMBASA	041-2224057
817	TNT EXPRESS WORLDWIDE KENYA	NAIROBI	0703052000
818	MVITA FREIGHT LTD	MOMBASA	041-2315845
819	TRADEWISE AGENCIES LTD.	NAIROBI	0713158066
820	CONVOY CARGO LOGISTICS	MOMBASA	041-2004815
821	FOOD CHAIN E.A. LTD.	MOMBASA	0721695141
822	SILVER ANCHOR FREIGHTERS LTD.	MOMBASA	0722710766
823	KENKAL SHIP & GEN CONTRACTORS	MOMBASA	041-2220007
824	KIPKEBE LTD.	MOMBASA	020-8070430
825	SAJA FREIGHT LINER LTD.	MOMBASA	0711762046
826	SAGITTARIUS TRADING LTD.	NAIROBI	6005515
827	CHAIRMAN HOLDING LTD.	NAIROBI	0722708498
828	THE HEARTLAND TRADING CO.	MOMBASA	041-2313369
829	ARAMEX KENYA LTD.	NAIROBI	
830	ANYTIME CLEARING & FORWARDING	MOMBASA	041-2224966

831	A.M.A. AL AMMARY LTD.	MOMBASA	0722411489
832	GLADIN LOGISTICS (K) LTD.	MOMBASA	0736810922
833	MONSOON MOVERS ENTERPRISES LTD.	NAIROBI	0720391255
834	VALUE CARGO LTD.	MOMBASA	0720761998
835	SLEEK INTERNATIONAL LTD.	MOMBASA	0722865151
836	MIG FORWARDERS LTD.	NAIROBI	0722466262
837	PEDWIN GEN CONTRACTORS & RENOVATORS LTD.	NAIROBI	0722660531
838	SPEEDWAY CARGO FORWARDERS LTD.	NAIROBI	0722511205
839	WEKALAMBA AGENCIES LTD.	MOMBASA	041-2317387
840	VISAN FREIGHT AGENCIES	MOMBASA	2496030
841	AFRIQUE SHIPPING SERVICES LTD.	NAIROBI	0725786437
842	BORA FREIGHTERS LTD.	NAIROBI	020-318001/3
843	BRAVILLE AGENCY LTD.	MOMBASA	2496030
844	STECA FREIGHT FORWARDERS CO.	NAIROBI	020-2148690
845	EURONIP LTD.	NAIROBI	0722521717
846	APEX STEEL LTD.	MOMBASA	041-2226471
847	KANDITO FREIGHT AGENCIES	MOMBASA	0720851866
848	MAGOT FREIGHT SERVICES LTD.	MOMBASA	222189
849	SIVORINE (K) LTD.	MOMBASA	041-2226052
850	MARUNI PRODUCTS CO. LTD.	MOMBASA	041-2319973
851	TERYANI AGENCIES LTD.	MOMBASA	0720938100
852	MUCH MORE C&F LTD.	NAIROBI	2229822
853	TURNING POINT FREIGHT LTD.	MOMBASA	2226156
854	SONDEKA FREIGHT FORWARDERS LTD.	NAIROBI	020-2212126
855	WILDAN CLEARING & FORWARDING	NAIROBI	0722324447
856	FIRST OPTIC SOLUTIONS	NAIROBI	
857	DELTA CARGO CONNECTIONS 2011	NAIROBI	0722718358
858	UKWALA FREIGHT FORWARDERS	NAIROBI	0722525167
859	ONE TOUCH CARGO SERVICES	NAIROBI	
860	GALAHANJI CARGO SERVICES LTD.	NAIROBI	020-2660043

861	MAST INVESTMENTS CO. LTD.	MOMBASA	041-2227832
862	RIFT CARGO HANDLING LTD.	NAIROBI	020-822594
863	OTOX MAWEZO LTD.	MOMBASA	0725437669
864	TRADEBIZ FORWARDERS LTD.	MOMBASA	041-2319779
865	LEENA APPARELS LTD.	MOMBASA	434314
866	FAIDA CARGO SERVICES LTD.	NAIROBI	020-6002995
867	KIMNET AGENCIES	MOMBASA	0722721994
868	TRADELIN EXPRES (K) LTD.	NAIROBI	020-553050
869	AIRMARITIME (K) LTD.	NAIROBI	020-896625
870	MUMILO FREIGHTERS LTD.	MOMBASA	041-2226526
871	THE NOAHS ARK ENTERPRISES	NAIROBI	601993/603616
872	UNION EXPRESS LTD.	NAIROBI	828645/6
873	CHIRO HEIGHTS INVESTMENTS	NAIROBI	0722738794
874	RIANAB LOGISTICS LTD.	NAIROBI	0722749213
875	STEFRAH AGENCIES	MOMBASA	041-2318360
876	SEMATI STORES ENTERPRISES	MOMBASA	041-2317012
877	EVOLVE HOLDINGS LTD.	NAIROBI	0722212455
878	MOMBASA LOGISTICS LTD.	MOMBASA	041-22205321
879	VERODAH FR. & LOGISTICS CO. LTD	NAIROBI	020-312201
880	PWANI OIL PRODUCTS LTD	MOMBASA	041-2495563
881	GROUPEX EAST AFRICA LTD	NAIROBI	041-23122173
882	SKYWARD INTL FR. FORWARDERS	NAIROBI	020-2514022
883	CORPORATE AVIATION LTD	NAIROBI	020-827157
884	DREAMLINE FREIGHTERS E.A. LTD	MOMBASA	0723647733
885	LEAPTRACKS KENYA LTD	MOMBASA	0724002529
886	ARPI LTD	NAIROBI	020357173
887	MUGENGA HOLDINGS LTD	MOMBASA	041-2319631
888	MAYA DUTY FREE LTD	NAIROBI	020-2107141
889	KENTAN SERVICES LTD	NAIROBI	020-789924
890	MARKENS FREIGHT LOGISTICS	MOMBASA	0723600835
891	SIMMONDS CARGO SERVICES LTD	NAIROBI	0206003305

892	SAHUSA FREIGHTERS LTD	MOMBASA	0721397018
893	EMOTEL KENYA LTD	MOMBASA	0722610149
894	INTERNET TRADE CONVEYORS	MOMBASA	041-2224235
895	AIRBRIDGE FREIGHT FORWARDERS	NAIROBI	020-311201
896	AIRMARINE CONVEYORS (K) LTD.	NAIROBI	0732969423
897	BAABZ FREIGHT FORWARDERS LTD.	MOMBASA	0720378714
898	BEEKAY LOGISTICS LTD.	MOMBASA	0701899977
899	BLITZ LOGISTICS LTD.	NAIROBI	0726873219
900	CULZENBERG FORWARDERS LTD.	NAIROBI	0725528667
901	HIMA FREIGHT FORWARDERS LTD.	NAIROBI	020-310902
902	IKONGO FARMS LTD.	MOMBASA	041-2317301
903	CARGOLOG EAST AFRICA LTD.	MOMBASA	0722345645
904	VIBGYOR FREIGHT SERVICES LTD.	MOMBASA	0722827860
905	SPARTAN LOGISTICS LTD.	NAIROBI	0202610267
906	VISHAMMAH ENTERPRISES LTD.	MOMBASA	0720291443
907	MOLINS FORWARDERS LTD.	NAIROBI	0734942096
908	ACCESS AFRICA LOGISTICS LIMITED	NAIROBI	313808
909	INFUSION LOGISTICS (K) LIMITED	NAIROBI	0722338626
910	COUNTY CLEARING& FORWARDING	NAIROBI	0726300002
911	CARIBBEAN FREIGHT LTD.	NAIROBI	020-2597596
912	PORTLINK HOLDINGS LTD.	NAIROBI	0716657207
913	TEKOL HOLDINGS (K) LTD.	MOMBASA	020-2593550
914	ZULA GLOBAL DEVELOPMENT LTD.	MOMBASA	041-2315029
915	FAST CARGO MOVERS CO. LTD.	MOMBASA	041-2317740
916	DOSAT FORWARDERS LTD.	MTWAPA	0722175255
917	MARITIME LOGISTICS LTD.	MOMBASA	0722701824
918	PRIME CATCH LOGISTICS (K) LTD.	NAIROBI	0726594639
919	MUPEKI HAULIERS LTD.	MOMBASA	0722319313
920	DERICKS CARGO LOGISTICS	MOMBASA	0721227008
921	WAL QUICK HOLDINGS CO. LTD.	NAIROBI	
922	SPRING LOGISTICS LTD.	MOMBASA	0722670066



923	INTERSPEED LOGISTICS LTD.	MOMBASA	0722935636
924	SEAROCK FREIGHT & LOGISTICS LTD.	MOMBASA	0713180988
925	KWAME FREIGHT LOGISTICS LTD.	MOMBASA	
926	OCEANROCK LOGISTICS LTD.	MOMBASA	0717-019160
927	DAMINT FORWARDERS LTD.	MOMBASA	0732680340
928	ORIENTAL EXPRESS FORWARDERS	NAIROBI	0721958088
929	EASTHAL LOGISTICS LTD.	MOMBASA	0724283546
930	WORLD DOMAIN LTD.	NAIROBI	0733235387
931	GALAD ENTERPRISES LTD.	NAIROBI	0714484756
932	CARGOMAX LTD.	NAIROBI	0729700046
933	LIBAAN LTD.	MOMBASA	0721545467
934	GREEN LEAF TRADING CO. LTD.	MOMBASA	0733606057
935	FARIHMA TRADING CO. LTD.	MOMBASA	0723558948
936	MASTERPIECE COURIERS SERVICES	NAIROBI	2045043
937	RICA LOGISTICS LTD.	MOMBASA	0722298745
938	TRADEPULSE (K) LTD	MOMBASA	2567160
939	SUPERWISE FREIGHTERS LTD.	MOMBASA	0722260460
940	CARGO WORLD LOG TRANSPORT LTD.	MOMBASA	041-2319121
941	YURAI INVESTMENTS LTD.	MOMBASA	0728161678
942	JOVAMA ENTERPRISES LTD.	MOMBASA	041-2317012
943	DAVCHARL LOGISTICS LTD.	MOMBASA	0733370096
944	BLUE LOGISTICS LTD.	MOMBASA	0723673649
945	LILY LOGISTICS LTD.	MOMBASA	0721413140
946	SASI FREIGHT SERVICES LTD.	MOMBASA	0722684742
947	DANROS (K) LTD.	MOMBASA	0723828181
948	HANGOOL INVESTMENT GROUP LTD.	NAIROBI	0722111219
949	EXROL FREIGHT LTD.	MOMBASA	041-2220501/2
950	INTER LOGISTICS LTD.	NAIROBI	020-3503366
951	CEDAR CARGO LTD.	NAIROBI	
952	FOURSEAS INTERNATIONAL LTD.	NAIROBI	0722843693
953	SUPREME OUTLETS LTD.	MOMBASA	0723459159

954	BEMMS LTD.	MOMBASA	0722471025
955	ZUKHRUF (K) LIMITED	NAIROBI	0722741439
956	DAWA LTD.	NAIROBI	3569904
957	DREAMLINE FREIGHTERS E.A. LTD.	MOMBASA	723647733
958	PHOENIX PROCUREMENT LIMITED	NAIROBI	0205205873
959	ALFAS CROSS LOGISTICS LTD.	NAIROBI	0722515913
960	FREMMY FREIGHT INT.I LOGISTIC LTD.	MOMBASA	
961	MACKENZIE MARITIME E.A. LTD.	MOMBASA	041-2230183-5
962	ALL SCOPE LOGISTICS LTD.	NAIROBI	0721809850
963	LINKFREIGHT E.A. LTD.	MOMBASA	0722831454
964	JADE PRIME LOGISTICS (E.A.) LTD.	MOMBASA	0722351520
965	HERBER LOGISTICS LTD.	MOMBASA	0722336347
966	KAMANGA FREIGHT SERVICES LTD.	MOMBASA	0721204235
967	HEROS CO. LTD.	MOMBASA	0721725885
968	UTILITY FREIGHT LOGISTICS LTD.	MOMBASA	0722784407
969	DANPA LOGISTICS LTD.	NAIROBI	0720480877
970	MEGRAN ENTERPRISES LTD.	MOMBASA	0701675297
971	HARMIC EXPRESS KENYA LTD.	MOMBASA	0722353536
972	INSTANT FREIGHT FORWARDERS	NAIROBI	020-3380347
973	SEAWORLD SHIPPING AGENCIES LTD.	NAIROBI	722160201
974	ISLAND EXPRESS SERVICES	MOMBASA	0722632739
975	CARGO PLAN MOVERS & FORWARDERS LTD.	NAIROBI	020-2495114
976	KIMM FREIGHTERS (K) LTD.	MOMBASA	0722841042
977	TAMANYA FR. & LOGs SERVICES LTD.	MOMBASA	0722521402
978	FERDINARD FR. & FORWARDERS LTD.	NAIROBI	
979	GALAHANJI CARCO SERVICES	NAIROBI	
980	WOLFENBERG INTERNATIONAL	NAIROBI	
981	TEPRA LOGISTICS LTD.	NAIROBI	
982	JAMREKS ENTERPRISES	MOMBASA	
983	MID AFRICA SERVICES LTD.	NAIROBI	

984	TRANSNET FREIGHT INTERNATIONAL	NAIROBI	
985	ARNOP LOGISTICS CO. LTD.	MOMBASA	
986	SPEAR LOGISTICS (K) LTD.	MOMBASA	
987	GIFTLINE FREIGHT SERVICES LTD.	NAIROBI	
988	FLOWERPORT LOGISTICS LTD.	NAIROBI	
989	KALEMU FREIGHTERS LTD.	MOMBASA	
990	FREIGHTNET LOGISTICS LTD.	NAIROBI	
991	PINNACO LOGISTICS LTD.	NAIROBI	
992	SUFIKE INVESTMENTS LTD.	NAIROBI	
993	ACTIVE FORWARDERS LTD.	MOMBASA	
994	ZAM ZAM C&F CO. LTD.	SUNA	
995	VESTERGUARD TRADING CO. LTD.	NAIROBI	
996	SMART TRADERS LTD.	MOMBASA	
997	SEACROSS FREIGHTERS E.A. LTD.	MOMBASA	
998	GREENBELT LOGISTICS LTD.	MOMBASA	
999	GEOMWA EXPRESS CARGO LTD.	MOMBASA	
1000	MUSTAFA MOHAMED ISSA LTD.	MOMBASA	
1001	DELTA HANDLING SERVICES	NAIROBI	
1002	VID FREIGHTERS LTD	NAIROBI	
1003	COASTAL FREIGHTERS E.A. LTD.	MOMBASA	
1004	BLUE OCEAN E.A. CO. LTD.	MOMBASA	
1005	AURUM MINERALS LTD.	NAIROBI	
1006	CASCADE SWIFT E.A. AGENCY LTD.	MOMBASA	
1007	APPLE LOGISTICS LTD.	NAIROBI	
1008	SAI CARGO MASTERS LTD.	NAIROBI	
1009	REMOVALS GOODS SERVICES LTD.	NAIROBI	
1010	BOLTSPEED CARGO FORWARDERS	NAIROBI	
1011	SYLLER IMPRESS CO. LTD.	MOMBASA	
1012	JUSS FREIGHTERS LTD.	MOMBASA	
1013	ALIMANN LOGISTICS LTD.	MOMBASA	
1014	HILLCONS ENTERPRISES CO. LTD.	MOMBASA	

1015	ALPINE TRADING LTD.	MOMBASA	
1016	ELDOM CARGO SERVICES	NAIROBI	
1017	ISSA CLEARING & FORWARDING CO.	MOMBASA	
1018	ALSHOG SYSTEMS LTD.	MOMBASA	
1019	INSPIRE AFRICA LOGISTICS	MOMBASA	
1020	AFRIQUE SHIPPING SERVICES LTD.	NAIROBI	
1021	EZY VENTURES LTD.	NAIROBI	
1022	ROLA FREIGHTERS CO. LTD	NAIROBI	
1023	KARICKO INVESTMENTS LTD.	NAIROBI	
1024	MAHEK LOGISTICS INT LTD.	MOMBASA	
1025	FREIGHTMAX CO. LTD	NAIROBI	
1026	RUSTIC DESIGNS LTD.	NAIROBI	
1027	KIM INVESTMENTS LTD.	NAIROBI	
1028	WATER FRONT ENTERPRISES LTD.	NAIROBI	
1029	EVERTRUST GLOBAL LOGISTICS LTD.	NAIROBI	
1030	STAREX FREIGHTERS LTD.	NAIROBI	
1031	DYNAMIC EXPRESS LTD	NAIROBI	
1032	MEDITERRANEO EXPRESS LTD.	MOMBASA	
1033	MUSTAFA FR. FORWARDERS LTD	NAIROBI	
1034	AVENFREIGHT LOGISTICS LTD.	NAIROBI	
1035	CHAMTECH LOGISTICS LTD.	NAIROBI	
1036	CHABS TRADE CONNECTIONS LTD.	MOMBASA	
1037	TRAWLERS LTD.	MOMBASA	
1038	JOBMA ENTERPRISES LTD.	MOMBASA	
1039	NEWLINE CARGO FREIGHTERS LTD.	MOMBASA	
1040	TRANSQUICK LTD.	MOMBASA	
1041	FEDERAL FREIGHT FORWARDERS LTD.	NAIROBI	
1042	INTER-TROPICAL LOGISTICS CO. LTD.	MOMBASA	
1043	NEW WIDE GARMENTS (K) EPZ LTD.	ATHI RIVER	
1044	DELTA CARGO CONNECTIONS 2011	NAIROBI	
1045	MUCH MORE C&F	NAIROBI	

1046	SPERANZA INTERNATIONAL LTD.	NAIROBI	
1047	JAMUSA ENTERPRISES LTD.	NAIROBI	
1048	CARGOMAX FREIGHTERS LTD.	MOMBASA	
1049	KANZIZE LOGISTICS LTD.	MOMBASA	
1050	JAMES FINLAY MOMBASA LTD.	MOMBASA	
1051	OGAKA FREIGHT LOGISTICS	MOMBASA	
1052	REFRIGERATED MEDICAL DISTRIBUTION LOGISTICS	NAIROBI	
1053	WINES OF THE WORLD LTD.	NAIROBI	
1054	KITAKA ENTERPRISES LTD.	MOMBASA	
1055	HANDY AIRCARGO LTD.	NAIROBI	
1056	RICHENS LOGISTICS LTD	NAIROBI	
1057	JAGOMA LOGISTICS LTD.	MOMBASA	
1058	ORBIT EXPRESS LPG LTD.	NAIROBI	
1059	PHAHIM FREIGHT FORWARDERS LTD.	MOMBASA	
1060	OTOX MAWEZO LTD.	MOMBASA	
1061	CARGO MOVERS LTD.	MOMBASA	
1062	ZAMIN ENTERPRISES CO. LTD.	MOMBASA	
1063	KESA LOGISTICS LTD.	MOMBASA	
1064	GLADIN LOGISTICS KENYA LTD.	MOMBASA	