

**ADOPTION OF LEAN SUPPLY CHAIN PRACTICES AND
PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

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DECLARATION

I declare that this research project is my original work and has never been submitted for the award of a degree in any other University.

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D61/67784/2011

This project has been submitted with my authority as the university supervisor.

Signature.....

Date.....

Mr. Tom Kongere

DEDICATION

My first debt of gratitude goes to my dear family members who stood with me throughout my studies and particularly for their unending support and prayers, I deeply appreciate you.

The next large debt is owed to my study colleagues, workmates and church members especially young professionals who have been there for me throughout the study duration and selflessly accorded me their support when I needed it, may God bless you all.

My supervisor, I owe you this gratitude for your guidance in the course work. Thank you for your support, your patience with me throughout and your understanding is greatly appreciated.

For all those lecturers at University of Nairobi, I take this chance to recognize you all.

To all I say, may God bless you.

ABSTRACT

This study sought to investigate the lean supply chain practices and impact on performance of commercial banks in Kenya. This study set to achieve three objectives; the first being to determine the effects of lean supply chain practices on the performance of commercial banks in Kenya, to document the extent to which lean supply chain practices have been adopted by commercial banks in Kenya and to find out the challenges faced by commercial banks in Kenya in their efforts to implement lean supply chain practices.

The goals for lean supply chain practices are to improve quality and reduce cost. To stay competitive in today's marketplace, a company must understand its customers' wants and needs and designs processes that meet their expectations and requirements. Among the areas highlighted include the various lean supply chain practice models that are being adopted; the benefits derived from the adoption of these practices and the challenges encountered in the implementation of the practices

Primary data was collected by use of questionnaire with both closed and open ended questions. The closed ended questions enabled the collection of qualitative data for analysis using the Likert scale while the open ended questions enabled the researcher to collect qualitative data on the respondents view on lean supply chain practices in commercial banks in Kenya. The study found out that most commercial banks in Kenya believe that lean supply chain practices enhance the long term business performance and success. The study 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 supply chain practices. The study established the following hindrances to lean supply chain practices implementation: external obstacles, logistic issues, smaller supplier's difficulties and global issues. These findings should help in encouraging the widespread adoption of lean supply chain practices by commercial banks in Kenya.

Due to tight schedules of the top management officers of the commercial banks in Kenya, the study encountered difficulties in gaining access to the respondents and the researcher had to keep rescheduling their time to align with the availability of the respondents.

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CHAPTER ONE

INTRODUCTION

1.1 Background

Staying competitive requires looking for new ways of reducing cost and increasing the quality of the company's product. Lai, (2009) argues that competitive advantage and leadership in the global marketplace can only be gained by applying lean principles to the supply chain. It is the leading way today; to reduce waste in either manufacturing or service industry. Lean is more than just a technical process change; it is a change in how you think about your business. Lean supply chain management requires businesses to examine every process in their supply chain and identify areas that are using unnecessary resources, which can be measured in monetary value, time or raw materials. This will improve the company's competitiveness as well as improve the company's overall profitability. Developing and achieving lean practices is not very easy, consumes a lot of time, entails breaking down of barriers between interested groups, demands a new approach, requires significant investment in time and resources.

Lean management involves close coordination between different units in an organization with more emphasis in sharing of information as Schoberger, (1982). point out that efficient and effective information sharing between chain agents is essential in order to achieve supply chain integration, and the improved results that arise from this indicate the importance of information flows. Lean management creates value to the customer perspective than to the producer perspective by redesigning organization into value streams and uncovering some actions that add value and those that do not are eliminated. Hobbs, (2007) it is a Pull system; where processes are inter-dependent and are demand driven other than Push system based on the forecasted demand as always adopted.

Under lean management, an organization always and continuously improves methods to reduce all forms of waste and rethinks the organization of work and the appropriateness of

current operations and systems to fit the process flow.

1.1.1 Lean supply chain practices

To exactly define lean is hard and in actual situation every company exercising lean will follow their own unique course (Lewis, 2000). Today, lean has evolved into a management approach that improves all the processes at each level of an organization (Womack, 1990; Lai, 2009).

Lean has to take a holistic approach for an organization to achieve results, it is a long term process where, people and right culture are essential to convert an organization into a lean enterprise (Lai, 2009; Henderson, 1999). According to Liker (1996); Lathin, (2001); Ferch,(1998) states that today's demand driven supply chains require lean procurement methods whose goals are: to eliminate waste in all procurement cycles, prevent shortages, reduce inventory investment, reduce procurement lead time and cost, increase inventory turnover and ensure customers satisfaction. These methods ensure greater efficiency and standardization of procedures. Thus applying lean practices in an organization can improve their financial performance.

However, companies may fail to effectively implement lean procurement methods due to lack of system thinking (Sohal and Eggleston, 1994). Employees may not be willing to adapt to new methods and may exhibit resistance to change. The organization may as well lack the internal capabilities to facilitate education and training, lack of clear responsibility in the supply chain, lack of management and suppliers engagement, insufficient, planning monitoring and control may also inhibit the effective implementation of lean procurement. Lack of clarity over the supply chain and the struggle to localize and differentiate value from waste may hinder effective implementation of lean procurement methods. It may also be costly to implement lean in the short run.

Many organizations choose not to use the word "Lean," but to label what they do as organizational transformation. This is to mean that lean is not a program or short term cost reduction exercise, but the way organization is managed and operates daily. It takes a long - term perspective and perseverance to become a lean organization. The core idea of "lean management" is to maximize customer value while minimizing waste. Simply, lean means creating more value for customers using fewer resources (Carreira, 2004).

According to Lean Enterprise Institute (2009) the term lean was coined by Krafcik in the late 1980's, even though the philosophy came to the Western world's attention in the early 1980's as a result of competition from Japan automobile industry which offered low prices and quality products.

1.1.2 Lean Supply Chain and Organizational Performance

A supply chain is a network that includes vendors of materials that transform those materials into useful products and distribution centers to get those products and services to customers. Without any specific effort to coordinate overall supply chain system each organization in the network has its own agenda and operates independently from the others. In managing the supply chain, the following are decision variables: Location of facilities and sourcing points, production- what to produce in which facilities, Inventory-how much to order, when to order and safety stocks, Transportation-mode of transport, routing and scheduling (Gilbert, 1990).

The Bullwhip Effect-A problem frequently observed in unmanaged supply chains. This effect is an oscillation in the supply chain caused by demand variability. The problem must be addressed in order to avoid poor service and higher costs that stem from it. This phenomenon has been observed across most industries, resulting in increased costs and poorer service (Plenert, 2006).

Supply Chain Structure-The performance of a supply chain is measured in terms of profit, average product fill rate, response time and capacity utilization. Profit projections may improve if another parameter is relaxed, but one must consider the impact of all aspects of the relaxed parameters on profits.

Capacity utilization should be high enough to produce overheads sufficiently, but not so high that there is no room to grow or to handle fluctuations in demand. Higher capacity utilization decreases downside risks since costs are reduced, but also limits the upside gains if future demand should be outstrip supply (Drew, McCullum, & Roggenhofer, 2004).

1.1.3 Kenya Commercial Banks

Commercial banks play a key role in our economy and are regulated by Central Bank of Kenya (CBK). According to CBK annual reports (2013), the number of financial institutions

comprised of 43 commercial banks, 1 mortgage finance company, 6 deposit taking microfinance institutions, 4 representative offices of foreign banks, 112 foreign exchange bureaus and 2 credit reference bureaus. The 43 commercial banks have come together under the Kenya Bankers Association (KBA), which serves as a lobby for the banking sector's interests and a forum to address issues affecting members. The Central Bank of Kenya (2013) has recognized a total of 43 commercial banks in Kenya and documented their strength in terms of their market share in gross assets.

The top 6 commercial banks in Kenya categorized as large banks in terms of gross assets include Kenya Commercial Bank (14.2%), Equity Bank Limited (8.6%), Co-operative Bank of Kenya (8.5%), Barclays Bank of Kenya (8.4%) and Standard Chartered Bank Kenya Limited (7.9%) and CFC Stanbic Bank Kenya Limited (6.7%). Of the top 6 commercial banks in Kenya, the first 3 are indigenous commercial banks (Kenya Commercial Bank, Equity Bank and Cooperative Bank) while the other three are subsidiaries of multinational banks (Barclays Bank, Standard Chartered Bank and CFC Stanbic Bank). The other commercial banks in Kenya are categorized into medium size commercial banks and in this category there are 14 commercial banks which hold between 1% and 5% of the total gross assets in the commercial banking industry in Kenya. Commercial Bank of Africa tops this list with 4% of the gross assets while Bank of India is bottom with 1.1% of the gross assets. The third category is the small banks which consist of 23 commercial banks which own less than 1% of the total gross assets in the commercial banking industry in Kenya. Top on this list is Consolidated Bank of Kenya with 0.8% and bottom is Jamii Bora Bank with 0.1% of the total gross assets.

Commercial banks in Kenya are facing a competition in product offerings and market share. The product offerings are almost identical and therefore each of the commercial bank is competing for the same customers. Service quality is the front that most commercial banks have chosen to excel in and this has led to the introduction of operational performance measures like complaints management, service metrics, customer call centers, suggestion boxes, customer surveys and measurements of turn-around times of every activity ranging from the time taken to accept a deposit to the time taken to make an Automated Teller Machine (ATM) transaction. These measures are the basis upon which the employees are

appraised and rewarded in form of bonuses, salary increments and promotions.

Generally the internal service quality management in the commercial banks in Kenya centers on executing transactions in a better, faster, more efficiently and more cost -effectively manner (www.kba.com).

Some key challenges for the banking industry in Kenya include; new regulations especially with the passing of the new constitution, Central Bank of Kenya CBK, required financial institutions to build up their minimum core capital requirement to one billion shillings (CBK annual reports, 2012).

1.2 Statement of the problem

Extensive research has been conducted in the field of lean procurement and much of it point to the fact that lean can lead to efficient procurement (Womack, Jones, Roos, 1990 & Liker, (2004). It is not enough to focus on manufacturing operations to eliminate waste; lean procurement must be extended to product development and aspects of distribution and supply chain management (Hobbs, 2007). Commercial banks have to meet various cost in their operations, like reduced interest rates, as set by Monetary Policy Committee, MPC on monthly basis, deposit expenses, better dividend payout to the shareholder and also staff continue to expect better remuneration from their employers, this means the banks have to consider ways of reducing their operations cost to meet these obligations whilst increasing their profitability.

Nyamwange, (2001) investigated strategic responses adopted by Kenya commercial banks to cope with competition in banking industry, but he did not capture lean as one of the strategies. According to Nairobi Securities Exchange (2014) lean manufacturing practices and performance of organizations listed at the Nairobi Securities Exchange, procurement methodologies used by large manufacturing firms in Nairobi, Kenya. However, research has not yet been done to establish lean management practices in Kenya commercial Banks. Keys (2011) did a study on effects of downsizing on workforce quality among commercial banks in Kenya, she found out that one cause of downsizing is to cut cost and remain competitive, however, this has detrimental effects on the workforce quality, may send wrong message to

employees, shareholders and media. It may also lead to reduced profits, tarnished reputation, not forgetting high employee turnover. Considering this as a main strategy adopted by commercial banks, the research will seek to determine lean as a more viable alternative with least negative impacts.

1.3 Research objective

The main objective of the research will be to investigate the adoption of lean management in Kenya

The specific objectives will be:

To investigate the extent of lean supply chain practices adoption by commercial banks in Kenya

To determine the lean supply chain practices commonly used by commercial banks in Kenya and their impact on performance

Establish the challenges that face lean supply practices by commercial banks in Kenya

1.4 Value of the study

The study will be of much importance and a guide to commercial banks managers and decision makers on a way of cutting cost with very minimal negative effects. The industry will also benefit by fully understanding the benefits of adopting lean management

The study will also be of great use to other non-banking industries since procurement cuts across all sectors and consequently lean management concept.

Scholars will also reap heavily since they will understand both theoretically and practically on knowledge of lean management. They will always use it as their reference and basis for further research.

The government technocrats will also make great use of the findings and replicate them in the

government practices by incorporating lean management as they formulate government policies

CHAPTER TWO

2.0 LITERATURE REVIEW

This chapter focuses on the literature review conducted by the researcher. It includes a review of the various studies that have been conducted by other researchers on lean supply chain performance by Kenyan commercial banks. Among the areas highlighted include the various lean supply chain practice models that are being adopted; the benefits derived from the adoption of these practices and the challenges encountered in the implementation of the practices. The chapter also provides research gaps identified and the conceptual framework to show the relationship between the dependent and the independent variables.

2.1 Overview of Lean practices

In the late 1970's, the US companies had a strong interest in the NC machine tools and in the advanced automation as well as in planning the material necessary for the production process (Mabert, 2007). Womack, et al (1990) in the machine that changed the world, uses the term Lean production in the contrast to the mass production system of the West. The Japanese companies focused on applying the Lean production principles using relatively simple technologies and lower costs automation at the expense of computer technology. The concept of Lean production is based on the Toyota production system (Spear & Bowen, 1999; Womack, Jones, & Roos, 1990) which focused on reducing waste, considering all aspects of the production process, using a variety of techniques and tools for eliminating waste, such as; just-in-time, cellular manufacturing, Value Stream Mapping, 5S, Kanban (pull) systems, Kaizen, synchronous manufacturing, Poka-Yoke (Bicheno, 2000; Rother & Shook, 1998), which resulted in the decrease of stocks and the execution time, an increase of the delivery performance, a rational use of space, a better resource utilization and an improved productivity and quality (Pavnaskar, Gershenson & Jambekar, 2003). Lean supply chain can be defined as a philosophy or as a strategy which depends on a set of practices used to minimize waste in order to improve an enterprise's performance (Womack, & Roos 1990).

Lean supply chain came from the Toyota production system, a concept adopted by many major companies across the world in an attempt to remain competitive in an increasingly globalized market.

Since the first use of the concept there have been some attempts to define the term Lean conceptually (Lewis, 2000 & Hobbs, 2003). Unfortunately the definitions are vague, and the lack of a clear definition leads to communication difficulties (Boaden, 1997) and the difficulties in implementing the lean production concept in enterprises as well as in establishing its precise objectives (Anderson, Eriksson, & Torstensson, 2006). Parker (2003) considers that, due to the so many different conceptual approaches of the lean term, it becomes difficult to identify the real benefits of its use. The lack of precise definition makes it difficult to establish if the changes occurred within a company are or not in accordance with the principles of Lean Supply chain, which leads to a laborious evaluation of the efficiency of the concept. It is therefore necessary to estimate the success of the lean

Supply chain before implementing it in order to avoid wasting time and money Pettersen, (2009). In an attempt to define Lean Production conceptually, we can say that it uses the just-in-time practices and aims at the rational use of resources, the strategies to improve the production process and the elimination of waste, and the use of managerial scientific techniques. It is however, difficult to formulate a complete definition encompassing all elements of Lean supply chain, which is in a constant development. Thus, today's definition reflects the current image, which at some point in the future will no longer be valid.

2.2 Lean Goals

The espoused goals of Lean supply chain systems differ between various authors. While some maintain an internal focus e.g. to increase profit for the organization, others claim that implementation should be done for the sake of the customers. Some commonly mentioned goals are to improve quality and stay competitive in today's marketplace; a company must understand its customers' wants and needs and designs processes that meet their expectations and requirements (Stadtlern, 2008). To Eliminate Waste; waste is an activity that consumes time, resources or space but does not add any value to the product or service.

To reduce time; reducing the time it takes to finish an activity from start to finish, its one of the most effective ways to eliminate waste and lower costs.

Reduce total costs; to minimize costs, a company must produce only to customer demand, overproduction increases a company's' inventory costs because of storage needs.

2.2.1 Lean strategies

Strategic elements of Lean can be quite complex and compromise multiple elements. Four different notions of Lean have been identified; one; Lean is a fixed state or goal (being Lean.), two; Lean as a continuous change process (becoming Lean), three; Lean as a set of tools or methods (doing Lean), four; Lean as a philosophy (Lean thinking.) .After formulating guiding principles of its Lean Manufacturing approach in the TPS, Toyota formalized in 2001 the basis of its Lean Management: The key managerial values and attitudes needed to sustain continuous improvement in the long run. These core management principles are articulated around the twin pillars of continuous improvement (relentless elimination of waste) and respect for people (engagement in long term relationships based on continuous improvement and mutual trust) (Suzaki, 1987).

2.3 Principles and Tools of Lean Supply Chain

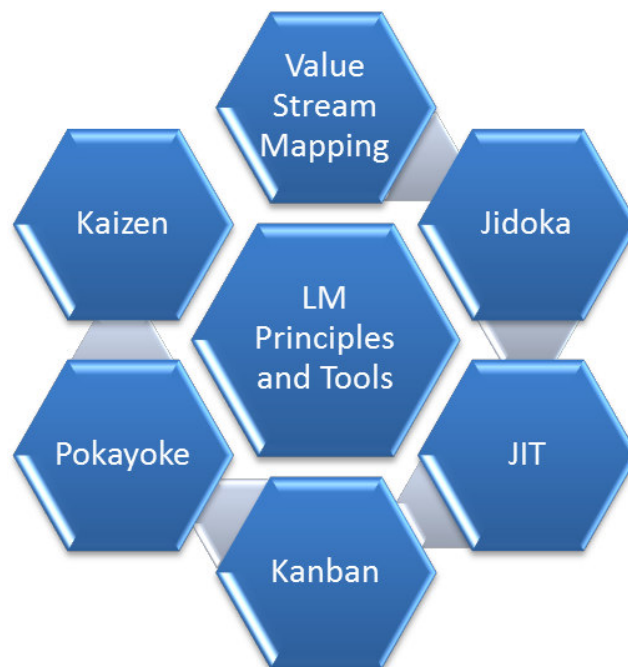
Lean production includes, on one hand, a strategy which depends on a set of tools and, on the other hand, the Lean thinking, which focuses both internally and reducing costs, and externally to increase customer satisfaction. The objective of this multi-dimensional approach is the reduction of costs by eliminating the non-value activities, using tools such as just-in-time, cellular manufacturing, Value Stream Mapping, 5S, Kanban (pull) systems, Kaizen (Bicheno, 2000; Rother & Shook, 1988; Kocakulah, Austill, & Shenk, 2011), total productive maintenance, Production smoothing or production leveling, setup reduction for waste elimination (Abdulmalek & Rajgopal, 2007; Scherrer-Rathje, Boyle & Deflrin,2009).The implementation of the efficient production practices based on the flow of optimization is expected to lead to better operating results using for example, an inventory leanness (Hofer, Eroglu, & Hofer, 2012), which in turn should enhance the enterprise's performances (Cuatrecasas-Arbo, L. Fortuny-Santos, & Vintro-Sanchez, 2011).

The literature emphasizes the fact that Lean production is mainly based on the just-in-time production.

The just-in-time method consists of an elaborate planning of the production process and the amount of raw materials required as used exactly where they are needed, resulting thus a reduction in the stocks of raw materials and parts.

In each stage of the production process only the amount needed must be obtained and it should be done only when it is required by the next working stage, according to the technological flux.

Figure 1. Principles and Tools of Lean Supply Chain



Source: (Author, 2014)

2.3.1 Value Stream Mapping

Is a Lean production tool used to design and analyze the production process? It is designed to create an easy way for managers to visualize the value flow. The value is defined as that thing which brings the product in the form desired by customers who are willing to pay for it (Kocakulah, Brown, and Thomson, 2008). The goal of the value stream mapping is to help managers identify waste in all their processes in order to eliminate them: the waste time of the

production process resulting from a faulty organization of the working equipment (motion), waiting, the time spent when handling the products from one stage to another of the production process, from the production workshops to warehouses (transportation), a production larger than it is required for the next stage of the production process (overproduction), the undesirable characteristics that affect the product functionality or its appearance, the refuse (defects), over processing and inventory.

2.3.2 Cellular Manufacturing and JIT

Is a Lean method which is based on the group technology principles? The workstations and equipment are organized in order to allow easy transition from one stage to another, resulting in a minimal handling of material, greater speed of working, eliminating unnecessary costs and having reduced stocks (Abdulmalek & Rajgopal, 2007).

2.3.3 Five (5) Ss

Another basic tool for the managers who want to adopt Lean supply chain is the 5S. The 5S has its origins in the Toyota system and refers to the words that describe the steps to be completed for each stage or phase (Cuatrecasas-Arbos, Fortuny-Santos & Vintro-Sanchez, 2011).

Seiri-Separate- is the first that consists of eliminating all that is not needed to complete the tasks-straighten and configure

Seiton-Sort- identifying the stages of production and the elements necessary for the performance of the tasks required in those stages, which are organized in the optimal manner in order to avoid wasting time on handling-clear out and classify

Seiso- Sweep and shine- everything must be kept clean and the production scraps and refuse should be removed.

Seiketsu- Standardize- standardization of the processes through efficient organization of the working equipment while programming them in order to have maximum efficiency-consistency and conformity.

Shitsuke- Sustain- The final step consisting of maintaining cleanliness and order every day-custom and practice.

The 5S program has a number of benefits, such as: Maintaining discipline, reducing production and handling time which leads to lower costs (Finch, 2011).

2.3.4 The Jidoka

Jidoka principle is a process of quality control and refers to the automation of the functions of the production supervision, which means that the personnel is warned in case of an abnormal situation in order to stop the production line, thus preventing wastage, refuse and additional output, focusing on the attention on understanding why the problems occurred and how they can be avoided in future (Keyte & Locher, 2003).

2.3.5 Poka-yoke

It refers to any mechanism that helps staff to avoid errors (Finch, 2011). Its purpose is to eliminate product defects by preventing, correcting or drawing attention to human errors. The Lean concept is criticized in the literature from the perspective of the personnel, because this side is less known, focusing primarily on techniques for improving the performance of the system. Jidoka and Poka-yoke suggest that employees cannot be trusted in order to have good quality products, creating a need to eliminate the possibility of human error in the system.

2.3.6 Kanban

Is a stock control system, and it is usually performed by the FIFO (first in first out) method. Kanban is an effective tool which contributed to the functioning of the production process as a whole (Syquequality, 2009). Sugimori (1977) stated that the Kanban system has many advantages over computer technologies, such as; reduced cost of information processing, it is easy to obtain and transmit information in a dynamic environment, the demand for materials is judiciously sized. Sugimori criticized the lack of respect for the human being of the enterprises whose production was controlled by computer systems (GoLeanSixSigma, 2012). The Japanese consider the Kanban system more transparent, allowing staff to understand the production process without the need to use complex software (GoLeanSixSigma, 2012).

2.4 The benefits of being 'Lean' – Waste Elimination

The benefits of Lean manufacturing come from the elimination of waste at all stages.

According to Mondem (1993) waste arrives in many ways in the production system:

Stock/ Inventory- JIT replace the idea of 'Just in Case'. This meant that inventory was held only because these were problems in the production system. This made it impossible to supply within a period when customers wanted orders. The process itself/ over processing-Some processes add no value.

Fitting and other adjustments are only required because of defects in upstream processes.

Material Movement/ Transport- The effect of excessive distances between processes is often disguised in a production system. Such movements and the associated stock that has to be in transit add no value (Trent, 2006). People Movement/Motion- Excessive movement of people may arise from poor job layouts, their having to go and look for material for the next task. Shops crowded with inventory lengthen the search too. Running process too early/ too fast/ overproduction-Overproduction leads to the buildup of inventory which not only wastes investment but also space and transport resources as the stock often has to be moved several times to keep out of the way. Waiting time between processes- This is wasteful because inability to deliver quickly loses the firm market opportunities (Glenn, 2010).

The Lean supply concept has been refined and developed over the past decades in Japanese industries. The reason being to improve quality and reduce costs to help Japanese businesses grow and become more competitive in world markets for selective production lines. The US followed suit by developing and implementing modified versions of JIT systems. Later another type of waste defined by Womack et al (2003), it was described as manufacturing goods or services that do not meet customer demand or specifications. Many others have added the waste of unused human talent. The benefits seen within non-process industries as shown in the figure below; taking the example of automotive industry, are well documented; Decreased lead times for customers, Reduced inventories for service industries, Improved knowledge management, More robust processes (as measured by less errors and therefore less rework) This makes Lean a very real and physical concept-especially for banks.

Figure 2. Benefits of Lean Supply Chain

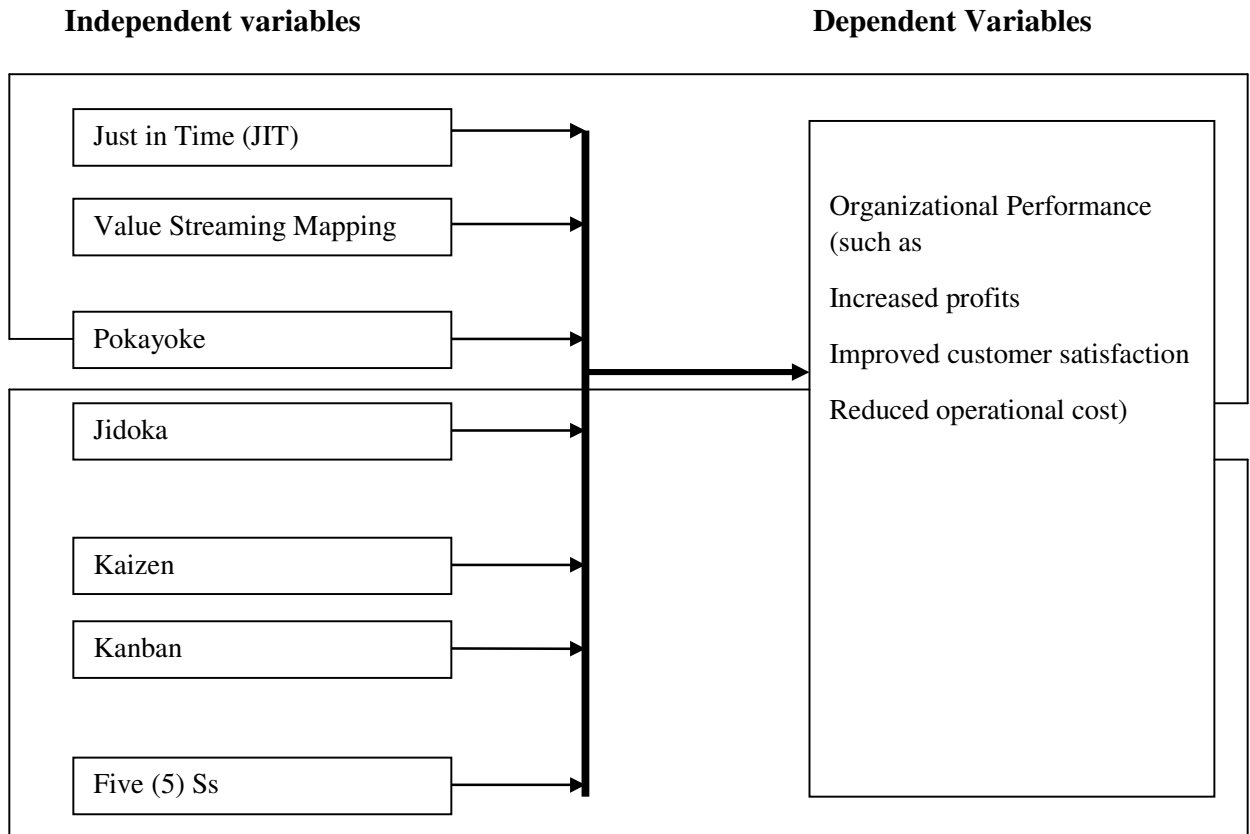


Source (Author, 2014).

Lean production has now expanded and lean thinking has been applied to all aspects of the supply chain. There are many well documented examples of the application of Lean thinking to business processes such as project management (Stadtler & Kilger, 2008) banking and so on. Lean can be applied to all aspects of supply chain and should be of the maximum benefit. The two biggest problems with the application of Lean to business processes are the perceived lack of tangible benefits and the view that many business processes are already efficient. Both assumptions can be challenged (Stadtler & Kilger, 2008). There are many tangible benefits associated with lean business processes. A lean business process will be faster, e.g. the speed of response to a request for the business processes will be faster, and as most business processes are linked to organizational supply chains, then this can deliver significant financial benefits to a company. The perception that a business process is already efficient is all too often an illusion. Functionally many business processes may appear very efficient, however the application of lean thinking forces us to review the whole supply chain in which the business process sits, and this frequently reveals bottlenecks and pockets of inefficiency.

2.5 Conceptual Framework

Figure 3. Conceptual framework



An efficient and effective lean sensitive organization will depend on value stream mapping; cellular manufacturing and JIT; jidoka; pokayoke; kanban; flow; pull; 5S and Kaizen-continuous improvement. A well implemented JIT system for instance whose core objective is to eliminate waste at every stage of production will translate into an improved organizational performance, and so is value stream mapping, cellular manufacturing, jidoka, pokayoke, kaizen and 5s (Trent, 2006).

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Research Design

This research was a cross sectional study investigating the lean supply chain practices and performance of Kenya commercial banks. A cross sectional survey was conducted to make out measurements at a specific point in time (Lewis, 2000).

3.2 Population

The population of the study was 43 Kenya commercial banks listed at the Kenya Bankers Association. This study was a census of commercial banks operating in Kenya under the banking sector and therefore sampling was not necessary.

3.3 Data Collection

The study made use of primary and secondary data. Data collection was by use of questionnaire. The questionnaire was structured to contain open and closed ended questions. Closed ended questions were used to enable the collection of quantitative data for analysis using a Likert-scale, while the open ended questions were used to enable the researcher to collect qualitative data on the respondent's view of lean supply chain practices in Kenya commercial banks. According to Glenn (2010) questionnaires are suitable to obtain important information about the population. Finch (2011), said that this method reaches a large number of subjects able to read and write independently.

The questionnaire was self-administered. It comprised of four sections; Section one was designed to collect data which described general information of the company, Section two designed to address the impact, section three gathered data relating to the extent to which lean supply chain practices have been adopted by Kenya commercial banks, and four addressed the challenges of lean supply chain implementation.

A 5 point Likert scale was used to determine reasons for Lean supply chain implementation. Respondents were individuals from each company reasonably assumed to be subject matter experts in Lean supply chain practices specifically Operations Managers, Procurement managers and their equivalent best placed to provide details regarding the operation of the company.

3.4 Data Analysis

Data collected was edited for accuracy, uniformity, consistency and completeness and arranged to enable coding and tabulation before final analysis.

Data was analyzed through descriptive statistics that are an indication of Lean supply chain practices by Kenya commercial banks. The findings are presented using tables, pie charts, percentages, proportions and frequency distribution. Frequency distributions and percentages have been used to analyze data in part one. Mean scores and standard deviations have been used to analyze the extent of the use of Lean supply chain practices by Kenya commercial banks. Frequency distribution and percentages have been used to measure barriers to Lean supply chain implementation.

The following model was used to show the relationship between Lean supply chain practices and the organizational performance:

$$Y=a+(b_1x_1)+(b_2x_2)+(b_3x_3)+(b_4x_4)+(b_5x_5)+(b_6x_6)+(b_7x_7);$$

Where Y=Organizational Performance,

a = the Y intercept when x = zero;

b₁, b₂, b₃, b₄, b₅, b₆ and b₇ are the regression weights attached to the variables;

X₁=Value Stream Mapping, x₂ = JIT, x₃= Jidoka, x₄ = Pokayoke, x₅ = Kanban, x₆= Kaizen, and x₇ = Five Ss.

The first objective was to determine the lean procurement methodologies being implemented by Kenya commercial banks. To achieve this, mean scores was used.

To address the second objective, i.e. to determine the benefits of implementing lean procurement methodologies among Kenya commercial banks, descriptive (mean and

standard deviation) and factor analysis were used to determine whether the variables could be categorized into the discussed benefits.

For the last objective, of establishing critical barriers to the implementation of lean supply chain practices, descriptive statistics was used. Factor analysis was also used to determine whether the variables can be categorized into the critical barriers discussed in the literature review.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter provides an analysis of data collected from the field. The results have been presented in tables, figures and content delivery to highlight the major findings. They are also presented sequentially according to the research questions of the study. Mean scores and standard deviations analyses have been used to analyze the data collected. The raw data was coded, evaluated and tabulated to depict clearly the lean supply chain practices and performance of commercial banks in Kenya.

4.2 General Information of the Company

The study sought to establish the General Information of the Company and the respondents employed in the study with regards to the gender, age, length of service in the current position, academic levels, Position of Respondent, Description of company ownership and Annual company turnover. This bio data points at the respondents' appropriateness in answering the study questions.

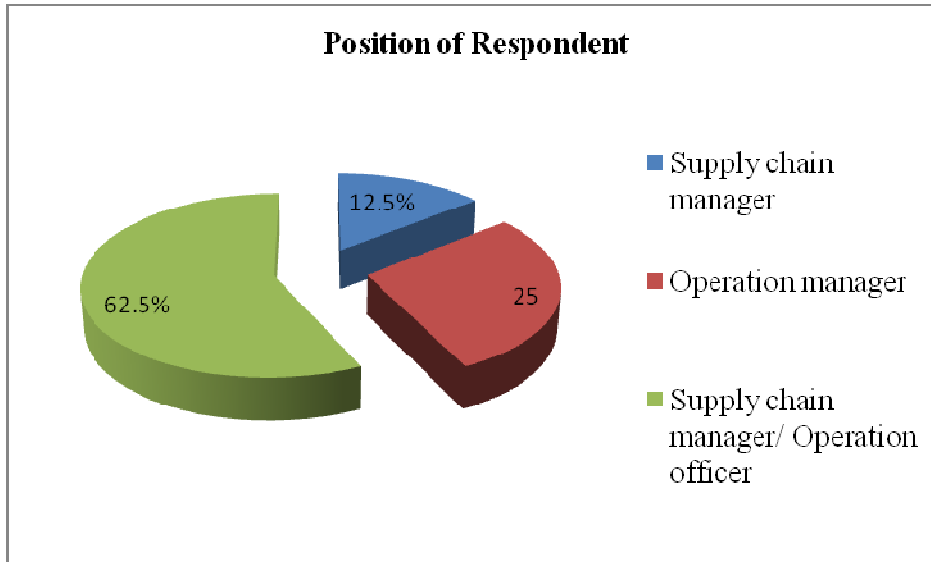
4.2.2 Position of the Respondent

The respondents were asked to indicate their current working position in the company. Figure 4.1 shows the results for the research question.

Table 1: Position of the Respondents

Position of the respondent	Frequency	Percentage
Supply chain manager	2	12.5%
Operation manager	6	37.5%
Supply chain manager/operation officer	8	50%

Figure 4.1: Position of the Respondents



From figure 4.1 shows majority of the respondents 62.5% of the respondents rates indicated that they work interactively in supply chain management and operation department, 25% of the respondent rates indicated that they work in operation department, 12.5% of the respondent rates indicated that they work in supply chain management department. Therefore respondents are rich in supply chain management knowledge.

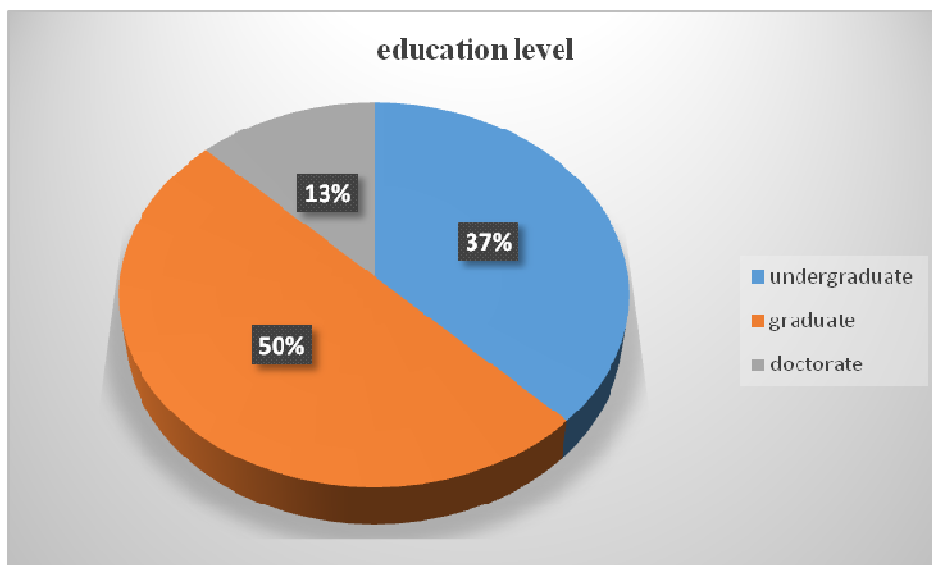
4.2.3 Education level of Respondent

The respondents were asked to indicate their academic highest attained levels. Figure 4.3 shows the study findings.

Table 3: Educational level of Respondent

Educational level	Frequency	Percentage
Undergraduate	6	37.5
Graduate	8	50
Doctorate	2	12.5

Figure 4.3: Educational level of Respondent



From figure 4.3 shows majority of the respondents 50% indicated they are graduate degree holders. This was followed by 37% for the undergraduate and 13%. This indicates that although there is high literacy level in commercial banks in Kenya, the number who have doctorate degree are fewer.

4.2.4 Gender

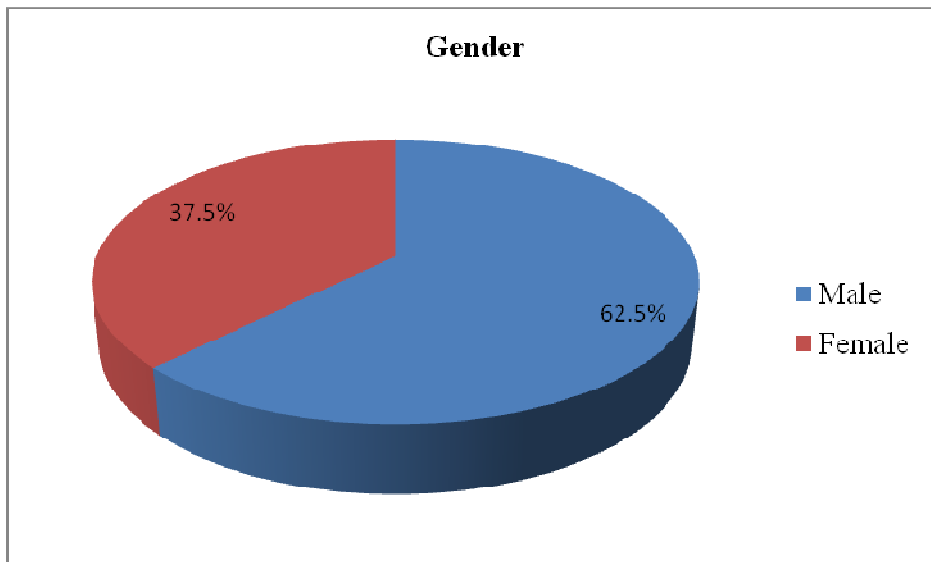
The respondents were asked to show their gender, this was expected to guide the researcher on the conclusions regarding the degree of congruence of responses with the gender characteristics. Figure 4.4 shows the study finding.

Table 4:

Gender

Gender	Frequency	Percentage
Male	10	62.5
Female	6	37.5

Figure 4.4: Gender



The results as in the figure 4.4 show that majority of the respondent were male at 62% while female was 38% implying that most of the workers were male.

This shows that majority of staff in Kenya commercial banks are men compared to women.

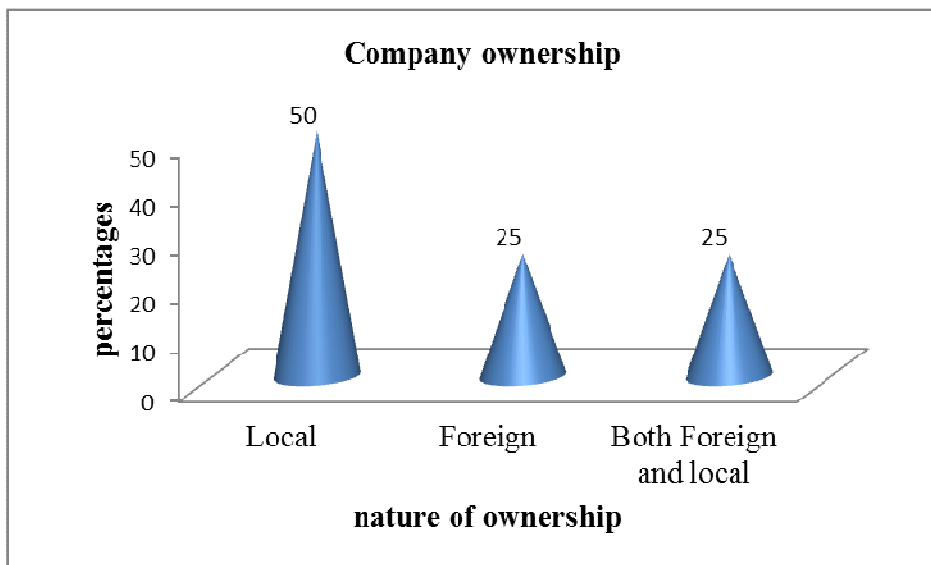
4.2.5 Description of Company Ownership

The respondents were asked to indicate the nature of ownership of the company they are working while drawing attention to shareholders and central location of their company. Figure 4.5 shows the study findings.

Table 4.5: Company ownership

Company ownership	Frequency	Percentage
Local	8	50
Foreign	4	25
Foreign and local	4	25

Figure 4.5: Company ownership



From figure 4.5 shows majority of the respondents 50% indicated that the companies are locally owned, 25% of the respondents indicated that the companies are foreign owned while another 25% of the respondents indicated that the companies are both local

foreign owned. This indicated that local ownership of Kenyan commercial banks dominant in comparison to foreign ownership and to those with both local and foreign ownership.

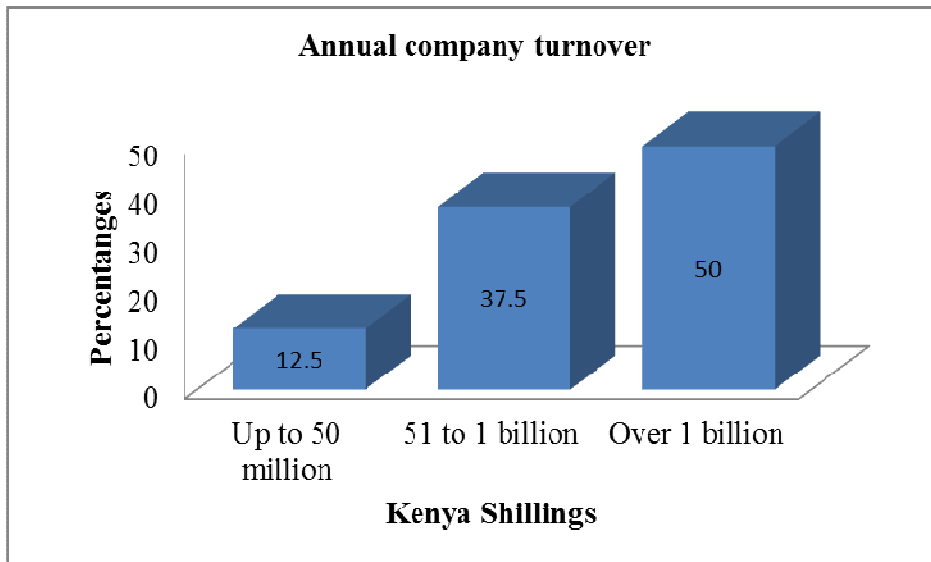
4.2.6 Annual company turnover

The respondents were asked to indicate the rate of annual company turnover in terms of Kenya shillings. Figure 4.6 shows the study findings.

Table 4.6: Annual company turnovers

company turnovers in Kshs	frequency	Percentage
Up to 100 million	2	12.5
101 million to 1 billion	6	37.5
Over 1 billion	8	50

Figure 4.6: Annual company turnovers



From figure 4.6 shows majority of the respondents 50% indicated that the annual

company turnovers is over one billion, 37.5 % of the respondents indicated that the annual company turnovers ranges between a hundred and one million to one billion while 12.5 % of the respondents indicated that the Annual company turnovers is below a hundred million. This shows that majority of Kenya commercial banks are multibillion companies and large in terms of revenue.

4.3 Effects of Lean Supply Chain Implementation on Organizations Performance

The respondents were asked to indicate their views of the attributes of the Lean supply chain practices adopted by firms that were presented to them. They were asked to rate the nature and extent to which they consider Value Stream Mapping, Just In Time, Flow and pull production, Pokayoke/Jidoka-Error Proofing/Automation, Kanban - Information Transparency, Kaizen/Continuous Improvements and Five (5) Ss attributes significant in Lean Manufacturing practices. The study findings are presented in Table 4.7 to Table 4.13

4.3.1 Value Stream Mapping

Table 4.7: Value Stream Mapping

Value Stream Mapping	mean	Standard deviation
Production smoothing	4.3750	.74402
Waste reduction	4.1250	.99103
Reduced lead time	3.3750	.74402
Enhanced quality of output	3.3750	.51755
Reduced production time	3.7500	1.03510

The results in table 4.7 above show that majority of the respondents with large extent indicated that production smoothing is significant in Value Stream Mapping in lean supply chain practices m=4.3750.

The respondents with large extent indicated that waste reduction is significant in Value Stream Mapping in Lean supply chain practices m=4.1250. The respondents with Moderate extent indicated that Enhanced quality of output is significant in Value Stream Mapping in Lean supply chain practices m=3.3750. The respondents with Moderate extent indicated that Reduced lead time is significant in Value Stream Mapping in Lean supply chain practices m=3.3750. The respondents also with Moderate extent indicated that Reduced production time is significant in Value Stream Mapping in Lean supply chain practices m=3.3750

4.3.2 Just In Time

Table 4.8: Just In Time

Just In Time	Mean	Standard deviation
Reduced manufacturing costs	4.0000	.75593
Waste reduction	3.8750	.64087
Reduced inventory	3.3750	.51755
Reduced changeover time	3.0000	.53452
Short setup time	2.7500	.70711

The results in table 4.8 above show that majority of the respondents with large extent indicated that Reduced production costs is significant in Just in Time in Lean supply chain practices m=4.0000. The respondents with Moderate extent indicated that waste reduction is significant in Just in Time in Lean supply chain practices m=3.8750.

The respondents with Moderate extent indicated that Reduced inventory is significant in Just in Time in Lean Manufacturing practices $m=3.3750$. The respondents with Moderate extent indicated that reduced changeover time is significant in Just in Time in Lean supply chain practices $m=3.0000$. The respondents with Small extent indicated that Short setup time is significant in Just in Time in Lean supply chain practices $m=2.750$

4.3.3 Flow and Pull Production

Table 4.9: Flow and pull production

Flow and pull production	Mean	Standard deviation
Production smoothing	4.2500	.70711
Decreased lead time	4.0000	.75593
Demand driven production	3.1250	.83452
Enhanced quality of output	2.3750	.74402

The results in table 4.9 above show that majority of the respondents with large extent indicated that Production smoothing is significant in Flow and pull production in Lean supply chain practices $m=4.2500$. The respondents with large extent indicated that Decreased lead time is significant in Flow and pull production in Lean supply chain practices $m=4.0000$. The respondents with Moderate extent indicated that Demand driven production is significant in Flow and pull production in Lean supply chain practices $m=3.1250$. The respondents with Small extent indicated that Enhanced quality of output is significant in Flow and pull production in Lean supply practices $m=2.3750$

4.3.4 Pokayoke/Jidoka-Error Proofing/Automation

Table 4.10: Pokayoke/Jidoka-Error Proofing/Automation

Pokayoke/Jidoka-Error Proofing/Automation	Mean	Standard deviation
Reduced lead time	3.8250	.74402
Waste elimination	3.3750	.74402
Enhanced quality of output	3.6250	.73402
Reduced errors	2.8750	.83452

The results in table 4.10 above show that majority of the respondents with Moderate extent indicated that Reduced lead time is significant in Proofing/Automation in Lean supply chain practices $m=3.8250$. The respondents with Moderate extent indicated that Enhanced quality of output is significant in Proofing/Automation in Lean supply chain practices $m=3.6250$. The respondents with Moderate extent indicated that Waste elimination is significant in Proofing/Automation in Lean supply chain practices $m=3.3750$. The respondents with Small extent indicated that Reduced errors is significant in Proofing/Automation in Lean supply chain practices $m=2.8750$.

4.3.5 Kanban - Information Transparency

Table 4.11: Kanban - Information Transparency

Kanban - Information Transparency	Mean	Standard deviation
Reduced cost of information processing	4.5000	.53452
Increase production process transparency	2.6250	.74402
Smooth information transmission	2.2500	1.03510

The results in table 4.11 above show that majority of the respondents with large extent indicated that Reduced cost of information processing is significant in information transparency in lean supply chain practices $m=4.5000$. The respondents with small extent indicated that increase production process transparency is significant in information transparency in lean supply chain practices $m=2.6250$. The respondents with small extent indicated that smooth information transmission is significant in information transparency in lean supply chain practices $m=2.2500$.

4.3.7 Five (5) Ss

Table 4.13: Five (5) Ss

Five (5) Ss	mean	Standard deviation
Sweeping/seiso	4.4444	.72648
Self-discipline	4.0000	.86603
Sorting/seiton	3.5556	.72648
Standardization/seiketsu	3.3750	.74402
Simplifying	2.6250	.91613

The results in table 4.13 above show that majority of the respondents with large extent indicated that Sweeping/seiso is significant in Five (5) Ss in Lean supply chain practices $m=4.4444$. The respondents with Large extent indicated that Self-discipline of output is significant in Five (5) Ss in Lean supply chain practices $m=4.0000$. The respondents with Moderate extent indicated that Sorting/seiton is significant in Five (5) Ss in Lean supply chain practices $m=3.5556$. The respondents also with Moderate extent indicated that Standardization/seiketsu is significant in Five (5) Ss in Lean supply chain practices $m=3.3750$. The respondents also with Small extent indicated that simplifying is significant in Five (5) Ss in lean supply chain practices $m=2.6250$.

4.3.8 Impact of lean Supply chain implementation

The respondents were asked to rate the nature and extent of impact of lean supply chain implementation to the provided statements.

Table 4.14: Impact of Lean manufacturing implementation

Impact of Lean Manufacturing implementation	Mean	Standard deviation
Profitability improvement	4.4444	.52705
Product and service quality improvement	4.4444	.72648
Improved material flow and through put	4.3333	.50000
Productivity improvement	4.0000	.86603
Lead time reduction	3.5556	.72648
Labor requirement reduction	3.4444	.72648
Work in process reduction	3.3750	.74402
Sales volume improvement	3.0000	.50000
Wastage reduction	2.8660	.52705
Inventory reduction	2.6250	.91613
Set up time reduction	2.0000	.70711
Manufacturing cost reduction	1.5556	1.5556

The results in table 4.14 above show that majority of the respondents with large extent indicated that Profitability improvement has significant in impact of lean supply chain implementation in Lean supply chain practices $m=4.4444$. The respondents also with large extent indicated that Product and service quality improvement has significant in impact of lean supply chain implementation in Lean supply practices $m=4.4444$.

The respondents with large extent indicated that improved material flow and through put has significant in impact of lean supply chain implementation in lean supply chain practices $m=4.3333$. The respondents with Large extent indicated that Productivity improvement has significant impact of lean supply chain implementation in Lean supply chain practices $m=4.0000$.

The respondents also with moderate extent indicated that Lead time reduction has significant in impact of lean supply implementation in Lean supply chain practices $m=3.5556$. The respondents with moderate extent indicated that Labor requirement reduction has significant in impact of lean supply implementation in Lean supply chain practices $m=3.4444$. The respondents with moderate extent indicated that work in process reduction has significant in impact of lean supply implementation in lean supply chain practices $m=3.3750$. The respondents also with moderate extent indicated that Sales volume improvement has significant in value stream mapping in lean supply chain practices $m=3.0000$. The respondents also with small extent indicated that inventory reduction has significant in impact of lean supply implementation in lean supply chain practices $m=2.6250$. The respondents with small extent indicated that set up time reduction has significant in impact of lean supply implementation in lean supply chain practices $m=2.0000$. The respondents with very small extent indicated that production cost reduction has significant in impact of lean supply implementation in lean supply chain practices $m=1.5556$.

4.4 The Extent of Adoption of Lean Supply Chain Practices

The respondents were asked to rate the extent of adoption by your organization for each of the following lean supply chain practices presented to them. Table 4.15 shows the study finding

Table 4.15: Principles or Tool

Principle/Tool	Mean	Standard deviation
Jidoka-Automation	4.4096	.78174
JIT (Just In Time)	4.2222	.44096
Pokayoke - Error proofing	4.0000	.70711
Value Stream Mapping	3.9876	.60093
Five (5) Ss	3.6667	.50000
Kaizen – Continuous Improvement	3.4444	.72648
Kanban – Information Transparency	3.0000	.70711

The results in table 4.15 above show that majority of the respondents with large extent indicated that Jidoka-Automation is adopted in lean supply chain practices $m=4.4096$. The respondents with large extent indicated that JIT (Just in Time) is adopted in Lean supply chain practices $m= 4.2222$. The respondents with large extent indicated that Pokayoke - Error proofing is adopted in Lean supply chain practices $m= 4.2222$. The respondents with moderate extent indicated that value stream mapping is adopted in lean supply chain practices $m= 3.9876$. The respondents with moderate extent indicated that Five (5) Ss is adopted in lean supply chain practices $m= 3.6667$. The respondents with moderate extent indicated that Kaizen-Continuous improvement is adopted in lean supply chain practices $m= 3.4444$.

The respondents with moderate extent indicated that Kanban – Information transparency is adopted in lean supply chain practices $m= 3.0000$

4.5 Correlation Analysis

Two predictor variable are said to be correlated if their coefficient of correlations is greater than 0.5. In such a situation one of the variables must be dropped from the analysis. As shown in table 4.16, none of the predictor variables had coefficient of correlation between themselves of more than 0.5 hence all of them were included in the model. The matrix also indicated high correlation between the response and predictor variables, that is, Value Stream Mapping, JIT (Just In Time), Jidoka-Automation, Pokayoke - Error proofing, Kanban – Information Transparency, Kaizen - Continuous Improvement, Five (5) Ss

Table 4.16: Pearson Correlation

**Table 4.16: Pearson Correlation
Correlations**

	Organisat ion performa nce	Value Strea m Mappi ng	JIT (Just In Tim e)	Jidoka- Automat	Pokayo ke - Error proofin g	Kanban – Informati on Transpare ncy	Kaizen - Continuo us Improvem ent	Fiv e (5) Ss
Organisati on performan ce	1.000							
Value Stream Mapping	.236	1.000						
JIT (Just	.352	.118	1.00					

In Time)			0					
Jidoka- Automati on	.467	.128	.247	1.000				
Pokayoke - Error proofing	.307	.254	.254	.380	1.000			
Kanban – Informati on Transpare ncy	.454	.306	.343	.342	.189	1.000		
Kaizen - Continuos Improvem ent	.456	.453	.432	.153	.245	.398	1.000	
Five (5) Ss	.334	.276	.353	.432	.178	.123	.443	1.0 00

Source: Researcher (2014)

4.6 Regression Analysis

A multivariate regression model was applied to determine the significant of each of the seven independent variables with respect to the organizational performance in adopting lean supply chain practices.

Table 4.17: Significance of the Regression Coefficient

The data for this is summarized in tables

4.1

		Unstandardized		Standardized		
		B	Std. Error	Beta		
(Constant)		.260	.460		0.565	.231
Value Stream Mapping	X1	.131	.048	.254	2.729	.001
JIT (Just In Time)	X2	.170	.045	-.300	3.778	.000
Jidoka-Automation	X3	.051	.023	.113	2.217	.002

Pokayoke - Error proofing	X4	.048	.022	.093	2.182	.000
Kanban – Information	X5	.054	.076	.098	3.451	.003
Kaizen - Continuous	X6	.143	.045	.143	2.347	.020
Five (5) Ss	X7	.068	.056	.094	2.198	.043

Source: Researcher (2014)

The regression model

found is;

$$Y = 0.260 + 0.131X_1 + 0.170X_2 + 0.051X_3 + 0.048X_4 + 0.054X_5 + 0.143X_6 + 0.068X_7$$

It is observed that all the coefficients are positive meaning that a change in any one of them affects organizational performance in the same direction. Using a significance level of 5% any variable having a p-value(sig.) less than 5% is statistically significant and this is the case for all the independent variables in this model ($x_1 = 0.1\%$, $x_2 = 0\%$, $x_3 = .2\%$, $x_4 = 0\%$, $x_5 = 0.3\%$, $x_6=2\%$ and $x_7=4.3\%$).

This means that that all the independent variables in this model are suitable predictors of organizational performance.

4.7 The Full Model

Analysis in table 4.18 shows that the coefficient of determination (the percentage variation in the dependent variable being explained by the changes in the independent variables) R squared equals 84.3%, that is, Value Stream Mapping, JIT (Just In Time), Jidoka-Automation, Pokayoke - Error proofing, Kanban – Information Transparency, Kaizen - Continuous Improvement, Five (5) Ss, leaving only 15.7% unexplained variance. The P- value of 0.000 (Less than 0.05) implies that the model of organization performance is significant at the 5% significance hence it’s a suitable prediction model. Anova P value of 0.00 in table 4.19 corroborates these findings

Table 4.18: Model Summary

		R Square	Adjusted	Std. Error of the Estimate	Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.918(a)	.843	.805	.51038	84.3	1.242	1	7	.000

Source: Researcher (2014)

Table 4.19: ANOVA

	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.852	1	.213	1.242	.000
Residual	6.173	7	.171		
Total	7.025	8	.384		

Source: Researcher (2014)

4.20 Discussion

In this study all the independent variables (Value Stream Mapping, Just In Time Jidoka-Automation, Pokayoke-Error proofing, Kanban-Information Transparency, Kaizen-Continuous Improvement Five Ss) are found to be significant in the prediction of Organizational Performance. The full model is also significant. These findings are consistent with those of Bicheno, (2000); Rother & Shook, (1988); Kocakulah, Austill, & Shenk (2011) who found out that lean production includes, a strategy which depends on a set of tools and, on the other hand, the lean thinking, which focuses both internally and reducing costs, and externally to increase customer satisfaction. The objective of this multi-dimensional approach is the reduction of costs by eliminating the non-value activities, using tools such as just-in-time, cellular manufacturing, value stream mapping, 5S, Kanban (pull) systems, and kaizen.

4.21 Challenges to Lean Supply Chain Implementation

The respondents were asked to rate the challenges/ barriers which prevent firms from adopting Lean supply chain practices. Table 4.20 shows the study finding

Table 4.18: Challenges to Lean Supply chain implementation

Challenges to LSC implementation	Mean	Standard deviation
Lack of top management commitment	3.7778	.44096
Poor infrastructure	3.6667	.50000
Lack of political goodwill	3.6667	.50087
Lack of interface with existing systems	3.5557	.52705
Poor information/data accuracy	3.2222	.83333
Lack of continuing education/training	2.8889	.92796
Government policies	2.4444	.52705
Power outages/blackouts	2.0000	1.11803
Lack of vendor support	1.7778	.83333
Lack of appreciation of resulting benefits	1.5566	.52715
High cost of electricity	1.5557	.52705
Employees resistance to change	1.5556	.52705
Lack of internal expertise	1.3333	.50000

The results in table 4.20 above show that majority of the respondents with moderate extent indicated that Lack of top management commitment is the challenges to Lean supply chain Implementation $m=3.7778$. The respondents with moderate extent indicated that poor infrastructure is the challenges to lean supply chain implementation $m=3.6667$. The respondents with moderate extent indicated that lack of political goodwill is the challenges to lean supply chain implementation $m=3.6667$. The respondents with moderate extent indicated that lack of top management commitment is the challenges to lean supply chain implementation $m=3.5557$. The respondents with moderate extent indicated that poor information/data accuracy is the challenges to lean supply chain implementation $m=3.2222$.

The respondents with small extent indicated that lack of continuing education/training is the challenges to lean supply chain implementation $m=2.8889$.

The respondents with small extent indicated that government policies is the challenges to lean supply chain implementation $m=2.4444$. The respondents with small extent indicated that power outages/blackouts is the challenges to lean supply chain Implementation $m=2.0000$. The respondents with very small extent indicated that Lack of vendor support is the challenges to lean supply chain implementation $m=1.7778$. The respondents with very small extent indicated that lack of appreciation of resulting benefits is the challenge to lean supply chain implementation $m=1.5566$. The respondents with very small extent indicated that high cost of electricity is the challenges to lean supply implementation $m=1.5557$. The respondents with very small extent indicated that employees' resistance to change is the challenge to lean supply implementation $m=1.5556$. The respondents with very small extent indicated that lack of internal expertise is the challenges to lean supply chain implementation $m=1.3333$.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents summary of findings as discussed in chapter four and interpretations of the results, conclusions and recommendations based on the findings and suggestions for further research.

5.2 Summary of the Findings

This study sought to achieve three objectives namely; to determine the effect of lean supply chain practices by commercial banks in Kenya, the extent to which lean supply chain practices have been adopted by Kenyan commercial banks and to find out the challenges faced by Kenyan commercial banks in their pursuit to implement lean supply chain practices. It was found out from the study that all the independent variables (Value Stream Mapping, Just In Time Jidoka-Automation, Pokayoke-Error proofing, Kanban-Information Transparency, Kaizen-Continuous Improvement Five Ss) are significant in the prediction of Organizational Performance.

The study confirmed that most Kenyan commercial banks had adopted the concept of lean supply chain in their operations ranking the tools of lean supply from the highly adopted to the least adopted in the following order; Jidoka-Automation, Just In Time, Pokayoke-Error Proofing, Value Stream Mapping, Five(5)Ss, kaizen-Continuous Improvement and Kanban-Information Transparency.

The research also looked into the challenges facing the implementation of lean supply chain practices and confirmed that lack of top management commitment, poor infrastructure, lack of political good will, lack of interface with existing systems, data inaccuracy, lack of training, government policies, power outages, lack of vendor support, lack of appreciation of resulting benefits, high cost of electricity, employees

resistance to change and lack of internal expertise affect organizational performance in that order.

5.3 Conclusion

From the finding of the study, there are some key issues in lean supply chain practices which are aimed at improving the state of lean supply chain practices and Performance of commercial banks in Kenya. Lean supply chain is becoming the next quality or e-business practice area. In the 1980s, companies with superior quality were able to more easily enter new markets and command higher prices for their products and services than companies with inferior quality. Now, quality is the price of admission for entering the business environment. E-Business is the 1980s equivalent; an e-Business strategy and presence is required in many markets. Today, many large Kenyan commercial banks are demanding that suppliers adopt lean practices. Lean organizations are more responsive to market trends, deliver products and services faster, and provide products and services less expensively than their non-lean counterparts. Lean crosses all industry boundaries, addresses all organizational functions, and impacts the entire system of the supply chain to the end customer. Additionally the findings from the research showed the need for establishing lean performance parameters and the use of strategic tools like just-in-time delivery of materials and minimization of inventories.

The focus on value creating activities towards the final customer is still missing in most of the companies implementing lean. Lean value system is evolving throughout the implementation process and involves series of value adding network of operations between the companies taking part in the value chain.

5.4 Recommendations

Lean supply chain practices should be utilized to improve quality, reduce operating costs and exceed customer expectations. To stay competitive in today's marketplace, a company must understand its customers' wants and needs

and designs processes that meet their expectations and requirements.

Lean production is mainly based on the just-in-time production. The just-in-time method consists of an elaborate planning of the production process and the amount of raw Materials required as used exactly where they are needed, resulting thus a reduction in the stocks of raw materials and parts. In each stage of the production process only the amount needed must be obtained and it should be done only when it is required by the next working stage, according to the technological flux. Before starting with the introduction of lean implementation actions it is strongly recommended to first of all make sure that the whole workforce understands that lean is more than just a toolbox, but also the use of teamwork and the elimination of non-value adding tasks. Conducting lean training and explaining that a fully integrated management philosophy like the TPS does not seek to reduce headcount but is a way to create new work and business which can clearly be proved by looking at actual good figures.

5.5 Limitations of the Research

Due to tight schedules of the top management among commercial banks in Kenya, the researcher encountered difficulties in gaining access to the respondents and the researcher had to keep rescheduling their time to align with the availability of the respondents.

Information relating to Lean supply chain practices is always treated with sensitivity. This caused difficulties in convincing the respondents of the importance of giving sincere answers to the asked questions evidenced through reluctance of accepting invitation to participate in the study. To counter the challenge, the researcher had to inform the respondents in advance the purpose for the research study being carried out, that it was meant for academic purpose only and not for other investigations or uses.

5.6 Suggestions for Further Research

This study concentrated on lean supply chain practices and the performance of Commercial banks in Kenya. The researcher recommends further research on the same topic but in other organizations other than commercial banks in Kenya, both within the country and outside the country. This will help to establish whether the same effects will be held true in organizations other than commercial banks in Kenya and in other parts in and out of the country.

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APPENDICES

Appendix 1: Introduction Letter

Nahashon Nderitu

MBA Student

University of Nairobi

School of Business

P.O. Box

Nairobi

26th August, 2014

To Whom It May Concern:

Re: Permission to Carry Out a Research in Your Firm

I am a Post graduate student at the university on Nairobi and in partial fulfillment of a Masters in Business Administration Degree; I intend to carry out a research on Kenya commercial banks. The topic of the research is the adoption of lean supply chain practices by Kenya commercial banks.

Your bank been chosen for the study and choice is based on the strategic importance in the achievement of the objective of the study. I therefore kindly request your approval of collecting data in the organization through the attached questionnaire which I request the heads of purchasing/ Procurement/ supply Chain department or in their absence their deputies to respond to. The research information will be confidential and will only be used for academic purposes.

Thank you in anticipation

Nahashon Nderitu:

Student ID. D61/67784/2011:

MBA Student, University of Nairobi

Appendix II: Research Questionnaire

This research is aimed at getting an understanding of the impact, challenges and benefits of implementing Lean supply chain practices by Kenyan commercial banks. The responses to this questionnaire will be purely used for academic purposes and will be treated with strict confidence.

Thank you for your assistance.

PART 1: General Information of the company

1. Position of Respondent

Supply Chain Manager Operations Manager Supply Chain/Operations Officer
Other (specify).....

2. Educational level of Respondent

Under graduate Graduate Doctorate
Other (specify).....

3. Gender

Male Female

4. How can you describe ownership of your company: please tick appropriately inside the box?

Local Foreign Both

5. Annual company turnover (Ksh)

Up to 100 million 101 to 1 billion Over 1 billion

SECTION TWO: Impact of Lean Supply Chain Implementation

- 1) Listed below are some of the attributes of the Lean supply chain practices adopted by firms.

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Please rank by a tick in the appropriate box the nature and extent to which you consider these attributes significant using the following rating; 5 = to a very large extent, 4 = Large extent, 3 = Moderate extent, 2 = Small extent, 1 = Very small

extent

Value Stream Mapping	5	4	3	2	1
Waste reduction					
Reduced production time					
Reduced lead time					
Enhanced quality of output					
Production smoothing					
Any other (please indicate)					
Just In Time					
Reduced inventory					
Short setup time					
Reduced changeover time					
Reduced manufacturing costs					
Waste reduction					
Any other (please indicate)					
Flow and pull production					
Enhanced quality of output					
Decreased lead time					
Demand driven production					
Production smoothing					
Any other (please indicate)					
Pokayoke/Jidoka-Error Proofing/Automation					
Reduced errors					
Waste elimination					
Enhanced quality of output					
Reduced lead time					
Kanban - Information Transparency					
Reduced cost of information processing					
Smooth information transmission					
Increase production process transparency					
Any other (please indicate)					

Kaizen/Continuous Improvement					
Production smoothing					
Waste elimination					
Enhanced quality of output					
Reduced errors					
Any other (please indicate)					
Five (5) Ss					
Standardization/seiketsu					
Simplifying					
Sorting/seiton					
Sweeping/seiso					
Self-discipline					
Any other (please indicate)					

2) Please rank by a tick in the appropriate box the nature and extent to which the implementation of lean supply chain practices has impacted to your company using the following ratings; 5 = To a very large extent, 4 = Large

extent, 3 = Moderate extent 2

= Small extent 1 = Very small extent

Impact of Lean Supply Chain Implementation	5	4	3	2	1
Work in process reduction					
Inventory reduction					
Lead time reduction					
Product and service quality improvement					

Productivity improvement					
Wastage reduction					
production cost reduction					
Set up time reduction					
Profitability improvement					
Sales volume improvement					
Labor requirement reduction					
Improved material flow and through put					
Any other (please indicate)					

SECTION THREE: The extent of adoption of lean supply chain practices

1) Indicate the extent of adoption by your organization for each of the following Lean

Manufacturing Practices. On a scale of 1 to 5 where 5 = to a very large extent, 4 = large extent, 3 = moderate extent, 2 = small extent, 1 = very small extent),

	Principle/Tool	5	4	3	2	1
1	Value Stream Mapping					
2	JIT (Just In Time)					
3	Jidoka-Automation					
4	Pokayoke - Error proofing					
5	Kanban – Information Transparency					
6	Kaizen - Continuous Improvement					
7	Five (5) Ss					
8	Any other (please indicate)					

SECTION FOUR: Challenges to lean supply chain practices

1) Listed below are some of the challenges/ barriers which prevent firms from adopting Lean Manufacturing practices. Please rank by a tick in the appropriate box the extent to which you agree with these challenges using the following rating; 5 = strongly agree, 4 = Agree, 3 = Undecided 2 = Disagree, 1 = Strongly Disagree.

Challenges to LM implementation	5	4	3	2	1
Lack of interface with existing systems					
Lack of internal expertise					
Government policies					
Lack of political goodwill					
Poor infrastructure					
Poor information/data accuracy					
Employees resistance to change					
Lack of vendor support					
Lack of appreciation of resulting benefits					
Power outages/blackouts					
High cost of electricity					
Lack of continuing education/training					
Lack of top management commitment					
Any other (please indicate)					

I sincerely thank you for the time you have taken to complete this questionnaire.

LIST OF COMMERCIAL BANKS IN KENYA

1. ABC Bank
2. African Banking Corporation
3. African Development Bank
4. Afrika Investment Bank
5. Bank of Africa
6. Bank of Baroda – Kenya
7. CFC Stanbic Bank
8. Chase Bank
9. Citibank NA Kenya
10. Commercial Bank of Africa
11. Consolidated Bank
12. Co-operative Bank
13. Co-operative Bank of Kenya
14. Development Bank Of Kenya Ltd
15. Dubai Bank Kenya Ltd
16. Dyer & Blair Investment Bank
17. Equatorial Commercial Bank
18. Equity Bank

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19. Fidelity Bank
20. Fina Bank
21. Giro Commercial Bank
22. Guardian Bank
23. Housing Finance
24. I & M Bank
25. Imperial Bank
26. Jamii Bora Bank
27. Kenya Commercial Bank – KCB

28. K-Rep Bank
29. National Bank of Kenya
30. NIC Bank
31. Oriental Commercial Bank Ltd.
32. Paramount Bank
33. Post Office Savings Bank – Kenya
34. Prime Bank
35. Standard Chartered Bank – Kenya
36. Standard Investment Bank
37. Suntra Investment Bank
38. UBA Kenya Bank