

**DETERMINANTS OF SUPPLY CHAIN PERFORMANCE
AMONG COMMERCIAL BANKS IN KENYA**

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DECLARATION

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

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

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DEDICATION

I dedicate this work to the memory of my late grandfather James Warui Muturi and my mother Mary Muthoni Warui for their wisdom, courage and passion and support for education. God bless them

ACKNOWLEDGMENTS

I wish to acknowledge my supervisors Ms. Zipporah Kiruthu, Dr. XN Ikaki for their continued guidance. I thank the bankers who participated in the research and provided data. I am indebted to my colleagues for their moral support and encouragement.

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Last but not least, I am also indebted to my MBA colleagues and friends and all those who assisted me in one way or another throughout this period of study and though I may not name each one of you individually, your contribution is recognized and appreciated immensely. I owe you my gratitude.

To you all, God bless.

LIST OF ABBREVIATIONS

| | |
|------|-------------------------------------|
| CBK | Central Bank of Kenya |
| ERP | Enterprise Resource Planning |
| ICT | Integrated Communication Technology |
| KBA | Kenya Bankers Association |
| KPI | Key Performance Indicators |
| R &D | Research and Development |

ABSTRACT

The study sought to investigate the determinants of supply chain performance among commercial banks in Kenya. The study was guided by the supply chain management theory. The study adopted a descriptive research methodology and conducted a census on 43 commercial banks that are licensed to operate in Kenya. Data was collected with the aid of questionnaires presented to the respondents who were employees of the commercial banks. Data was analyzed using software, a regression model fitted and the relationship between the independent and dependent variables shown by the co-efficient of correlation. The mean and standard deviation were used to measure the central tendency and dispersion. The study concluded there is a positive strong relationship between performance and the independent variables as shown by the Pearson's co-efficient correlation which is significant as indicated by the P-value at 95% level of confidence. 79.2% of variations of changes in the dependent variable can be explained by variations in the independent variables which were culture, ICT and integration, trust, joint planning and decision making, knowledge and information sharing. The study conclusion agreed with (Hatry,2006); There are various determinants of supply chain performance that contributes to efficient and effective performance of supply chain in the organization namely ICT, knowledge and information sharing, trust, culture and joint decision making .

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Today's marketplace is shifting from individual company performance to supply chain performance: the entire chain's ability to meet end-customer needs through product availability and responsive, on-time delivery. Supply chain performance crosses both functional lines and company boundaries. Functional groups for example engineering, research and development (R&D), manufacturing, and sales/marketing are all instrumental in designing, building, and selling products most efficiently for the supply chain, and traditional company boundaries are changing as companies discover new ways of working together to achieve the ultimate supply chain goal, the ability to fill customer orders faster and more efficiently than competitors has become a major priority to most organizations (Gunasekaran et al., 2004).

A company needs performance measures, or "metrics" to achieve supply chain performance improvements. Performance measures must show not only how well an institution meets the needs of its customers (service metrics) but also how it handles its customers in terms of quality and efficiency to add customer value for goods and services. The cross-functional nature of many supply chain improvements, the performance measures of an organization must strive to achieve and improve supply chain performance to increase the level of efficiency in service delivery (Cuthbertson, 2011).

The role of performance measures in the success of an organization cannot be overstated because they affect strategic, tactical and operational planning and control. Performance measurement and metrics have an important role to play in setting objectives, evaluating performance, and determining future courses of actions. Many metrics used in supply chain performance evaluation have been designed to measure operational performance, evaluate improved effectiveness, and examine strategic alignment of the whole supply chain management (Cuthbertson & Piotrowicz, 2011). Individual measures of supply chain performance have usually been classified into four categories: quality, time, cost and flexibility. Furthermore, they have also been

grouped by quality and quantity, cost and none cost, strategic/operational/tactical focus, and supply chain processes (Shepherd and Günter, 2006).

1.1.1 Supply Chain Performance

Cai et al, (2008) defined supply chain performance as the entire chain's ability to meet end-customer needs through product availability and responsiveness on-time delivery. Supply chain performance involves both functional lines and company boundaries. Improving supply chain performance is a continuous process that requires both an analytical performance measurement system, and a mechanism to initiate steps for realizing key performance indicators (KPI) goals.

The mechanism to achieve KPI goals is referred as KPI accomplishment; it connects planning, and execution, and builds steps for realization of performance goals into routine daily work. To measure supply chain performance, there are a set of variables that capture the impact of actual working of supply chains on revenues and costs of the whole system. These variables as drivers of supply chain performance are always derived from supply chain management practices (Stewart, 1995).

After identifying KPIs, managers of an organization have to achieve improvement in them, through continuous planning, monitoring and execution. According to the results of selected KPIs' accomplishment, managers may create current reports on KPIs, to compare multiple plans of supply chain management. In this performance management cycle, there are many challenges, both in performance measurement and its improvement (Cai et al, 2008). Supply Chain Performance can be measured in the context of the following supply chain activities/processes: plan, source, make/assemble, and (4) delivery/customer. These activities are considered at various levels of management - strategic, tactical, and operational levels.

1.1.2 Determinants of Supply chain Performance

There are various determinants of supply chain performance that contributes to efficient and effective performance of supply chain in the organization namely ICT, knowledge and information sharing, trust, culture and joint decision making (Hatry, 2006). Regular measurements of a system's services and programs are important from a manager's perspective especially in the banking systems (Simons 1990). This is because he or she is looking to measure progress towards managing for results; which is a customer oriented progress that focuses on maximizing benefits, and minimizing the negative consequences of service programs. Performance measures are recognized as important tools of all Total Quality Management programs. Managers and supervisors directing the efforts of an organization or a group have a responsibility to know how, when, and where to institute a wide range of changes. These changes cannot be sensibly implemented without knowledge of the appropriate information upon which they are based (Flamholtz, Das and Tsui, 1985)

Supply chain integration includes the internal linkages among the departments, functions, or business units within the firm that source, make, and deliver products and the external linkages with entities outside the enterprise including the network of direct suppliers and their suppliers and direct customers and their customers this significantly contributes to supply chain performance. Information sharing does not only share information with partners, but also provides adequate, timely and accurate information (Politt & Bouckaert, 2004).

In other words, information sharing should include the concept of information quality. Information quality includes such aspects as the accuracy, timeliness, adequacy, and credibility of information exchanged. The senior procurement managers are influential people in procurement processes since their joint planning decisions affect whole supply chain network (Akintoye, 2000). Proper decision making enhances efficient and effective supply chain management system through proper administration of supply chain (Chenhall, 2000).

1.1.3 Banking Industry in Kenya

The Banking industry in Kenya is governed by the Companies Act, the Banking Act, the Central Bank of Kenya Act and the various prudential guidelines issued by the Central Bank of Kenya (CBK). The banking sector was liberalized in 1995 and exchange controls lifted. The CBK, which falls under the Minister for Finance docket, is responsible for formulating and implementing monetary policy and fostering the liquidity, solvency and proper functioning of the financial system. Due to the dynamic nature of the contemporary business environment, the banking industry has undergone various changes in order to cope up with competition in the market (KBA, 2013).

There has been a tremendously growth of technology in the banking operations in Kenya, an example is ICT integration between banks and suppliers whereby cheque books are ordered at branch level then delarue (a money manufacturing firm prints them and then it distributes them to different banks and branches). Commercial banks engage in joint planning in decisions making with its supply chain partners to increase transparency and information sharing. Trust play pivotal role in maintaining and developing supplier relationship management within the supply chain system in the banking industry, sharing of information involves three parties: the bank, its suppliers or outsourcing firm and money manufacturing firms for example delarue (CBK, 2013). To improve supply chain performance, most banks have improved their supply chain networks through investing in modern technologies for example information communication technology which has enabled integration in order to improve the process of decision making and sharing of information between supply chain partners in supply chain networks.

Most banks have adopted integrated systems to enhance coordination, information sharing, and supplier relationship management in their supply chain systems. Most commercial banks are moving from a manual system of supply chain for example: (Accpac) to a modern system of supply chain for example; enterprise resource planning (ERP) which is faster, reliable, cost saving and accurate (CBK, 2013). This has been driven by the increased demand for goods and services in the banking industry for example: buying of stationeries, outsourcing of services, alarm systems, security services etc (KBA, 2013). Some commercial banks in Kenya have installed

ERP to integrate their systems with their suppliers through online LPO, information sharing, monitoring their suppliers, avoiding stock outs, enhancing communication, and enhancing transparency in awarding tenders.

1.2 Research Problem

Traditional company boundaries are changing as companies discover new ways of working together to achieve the ultimate supply chain goal, the ability to fill customer orders faster and more efficiently than the competition (Stewart, 1995). This has triggered the need for performance measures, or metrics, for global supply chain performance improvements. According to Beamon (1999) performance measures must show not only how one is providing for your customers (service metrics) but also how an organization is handling its business (speed, asset, inventory and financial metrics). Given the cross-functional nature of many supply chain improvements, your metrics must prevent "organizational silo" behavior which can hinder supply chain performance (Gunasekaran et al, 2004).

In the banking industry in Kenya, most commercial banks have invested in information communication technology to coordinate their supply chain partners through enhanced information sharing. This form of system integration enables the firm to meet customer needs through a process of forward and reverse integration. This helps in saving costs, efficiency and minimizing stock outs. This reduces holding costs leading to quality service and improved customer satisfaction for example most commercial banks outsource security and cash on transit services from G4S this highly contributes to information sharing which is essential in reducing fraud and theft by distributing bank products like cards, cash, hardware on time to mitigate fraudulent practices(CBK, 2013).

Some local studies have focused on supply chain performance, Gichuhi (2003) found that integration highly influence supply chain performance among commercial banks in Kenya. In another study, Livohi (2012) concludes that the downstream supply chain performance measurement led to supply chain performance in oil marketing

companies in Kenya. A study by Gwako (2008) found that supply chain management was key in achieving performance of Kenya Airways. These studies were too broad and thus did not address the problem of this study which is to establish the determinants of supply chain performance among commercial banks in Kenya. This study answers the following the research questions: what are the main determinants of supply chain performance in commercial banks in Kenya? What are measures of supply chain management In commercial banks in Kenya? and what is the relationship between supply chain performance and banks profitability?

1.3 Research Objectives

This study has two objectives which are:

- i. To establish main determinants of supply chain performance in commercial banks
- ii. To establish the relationship between supply chain performance and profitability in commercial banks in Kenya

1.4 Value of the Study

The study will provide more knowledge for researchers and academicians who may be interested in this field of study or other related topics. It will also serve as a basis for further research. The findings of the study will be useful to commercial banks in Kenya will also be able to find out how measures of performance affects supply chain performance. This information can be used in setting up supply chain policies and procedures that are significant in enhancing bank performance in terms of achieving quality and efficiency in their supply chains.

Other non-banking institutions will also benefit from the findings of this study since it will shed more light on the determinants of supply chain performance among commercial banks in Kenya. Commercial banks of Kenya will also benefit from the findings of this study by establishing the measures of supply chain management in commercial banks in Kenya.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

The purpose of this section is to provide a critical evaluation of the available research evidence about supply chain performance among commercial banks in Kenya. It covers the determinants of supply chain performance, measures of supply chain performance and the relationship between supply chain performance and profitability.

2.2 Determinants of Supply Chain Performance

There various determinants that influence supply chain performance in organizations, the main determinants of supply chain performance among commercial banks include ICT, knowledge and information sharing, trust, culture and joint decision making.

2.2.1 ICT Integration

Barman et al., (2001) argue that the integration process includes activities that require, share, as well as consolidate, strategic knowledge and information with parties outside the immediate organization. Barney (1991) further defines supply chain integration as the linkages among various supply chain elements. Supply chain integration includes the internal linkages among the departments, functions, or business units within the firm that source, make, and deliver products and the external linkages with entities outside the enterprise including the network of direct suppliers and their suppliers and direct customers and their customers this significantly contributes to supply chain performance (Andraski, 1998).

ICT tools support supply chain activities, proper planning and management strategic decisions by a holistic visibility on inventory demands patterns, carrying costs, transportation, customer location, shipment sizes, facility location, capacity and use design for recycle and reuse, limit waste and defects. An ICT tool (ERP) enhances the performance of the entire supply chain to make it less troublesome (Frohlich and Westbrook, 2001).

Organizations must be sensitive of the ever changing business environment that dictates the competitive environment they operate in. Staying ahead of the competition ensures an organizations survival and lagging behind may lead to its demise. Embracing of Information Communication Technology (ICT) ensures that the supply chain balances its need to satisfy customer needs and also to manage costs so as to attain profits. ICT tools offer a good strategy within an organization to achieve strategic goals of customer satisfaction and profitability through cost management. Of late, ICT tools have been used to ensure efficient and effective performance of supply chain (Ambrose et al., 2008).

2.2.2 Knowledge and Information Sharing

Bowersox et al., (1999) showed that knowledge and information sharing is related to the use of IT and sharing including formal and informal information sharing, communicating and determining customers' future need and participation in sourcing decision. Bask and Juga (2001), mentioned that information sharing refers to the extent to which critical and proprietary information is communicated to the firm's supply chain partner (Enz et al, 2012).

Lack of information sharing leads to supply chain challenges, this happens when an organization fails to share information with suppliers. This may lead to communication breakdown within supply chain partners. This leads to prolonged delivery of goods and services leading to increased storage costs and leading to a decrease in organizational performance. Dixon (2012) explained that supply chain management challenges have increased globally due to the turbulent nature of the environment due to risks and uncertainties. Small and mid-sized organizations today are now starting to tap the value of developing and executing supply chain excellence strategies through improving their information sharing strategies as large enterprises have been doing for years.

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2.2.3 Trust

Trust plays a fundamental role in strengthening the relationship between the organization and its suppliers to also build a good working relationship between the supply chain partners. This highly contributes to organization performance since it's able to get goods and services on time and deliver the same to its customers. This improves the quality of services of the firm and this helps in building a corporate reputation which is essential in enlarging the market share of the firm.

That trust is key to any successful supplier relationship management. A good relationship is built on trust between the organization and the supplier. An organization should be able to identify a trustworthy supplier who can be relied upon to supply goods and services to the organization on time. One of the most critical factors in a committed and collaborative relationship between supply chain partners is trust. Trust between the firm and its supplier's leads to a successful supply chain relationship; if not, transaction costs can rise through poor performance (Aulakh, et al, 1996).

Organizations need trust to achieve flexibility and agility. However, establishing trust can be elusive and even harder to maintain. It is also true that trust is both individual and institutional. Trust in a supply chain is based determined by commonalities among supply chain partners that can take patience and time to develop. There is both risk and interdependence in a supply chain relationship however; there must be an implicit agreement not to exploit the partner's vulnerabilities. This takes development, honesty and openness to be successful (Baker et al., 1999).

2.2.4 Culture

Barney (1986) defines organizational culture as “a complex set of values, beliefs, assumptions, and symbols that define the way in which a firm conducts its business. In his study of sustainable competitive advantage, he argues that organizational culture has all-encompassing effects on a firm because it not only defines who this firm’s relevant employees, customers, suppliers, and competitors are, but it also defines how this firm interacts with its supply chain partners. Brill, Bishop and Walker (2006), propose a competing values framework to examine organizational culture. In reference to Wang et al., (2010), this framework focuses on conflicts within a system, specifically the conflict between stability and change, and the conflict between the internal organization and the external environment.

Given the nature of supply chain integration, this framework is considered appropriate for examining the relationship between organizational culture and supply chain integration. Barney (1986) explains that the culture of an organization strengthens the relationship between the suppliers and the organization since they understand the processes and procedures when seeking to deliver goods and services to a customer. A new supplier might experience challenges in supply of goods and services especially if the supplier is new to certain rules and procedures. This makes it difficult for the supplier to deliver efficiently since they are more likely to experience challenges in the process of delivering services. Existing supplier are likely to have an easy time when dealing with an existing customer since they fully understand the policies of the company and the requirements needed to deliver goods and services.

2.2.5 Joint Planning Decision Making

Zhang (2007), management should be vigilant and careful when making joint planning supply chain decisions. Neely (2005) explained that managers should be careful when making joint planning decisions, they should work towards achieving efficiency in the supply chains. Managing a supply chain with several supply chain partners poses a major challenge to supply chain management making it difficult to achieve efficiency in supply chains. Hoover (2003) further indicated that decisions have long-term effects on the performance of the firm. Managers of an organization

should make accurate decisions since poor decisions negatively impact on the performance of the organization.

Managing supply chains is not a simple task at all. Decisions made by the management have a significant impact on the long-term sustainability of the organization. Supply chain decisions are key in coordination of supply chain functions since they act as a guide in implementation of supply chain strategies. Fawcett et al. (2008) define supply chain challenges as the 'stumbling blocks' towards achieving efficiency in supply chain. Supply chain challenges inhibit the smooth flow of goods and services from the supplier to the final consumer of the product. Nyamu (2012) argued that supply chain challenges are mostly attributable to lack of information sharing which plays a critical role in enhancing communication within supply chain partners to facilitate faster decision making. Information should be shared and distributed timely within supply chain channels.

2.3 Supply Chain Performance and Profitability

Efficient supply chain systems play a pivotal role in enhancing the supply chain function; this helps the organization to gain value for goods and services delivered to customers. This builds a positive image and trust on the firm's products leading to increased sales and profitability. With an efficient supply chain system, the firm is able to save costs for example stock out costs, this increases cost savings and profitability of a firm (Beamon and Ware, 1998).

Integration is an important component in achieving supply chain performance of an organization. A firm that invests in modern technologies for example ICT is able to save communication costs between the supplier and the firm this enables the firm to improve its level of profitability. Efficient supply chain systems increase the speed to deliver goods and services to the final consumer and this improves the sales of a firm leading to an increase in profits (Baker, Simpson and Siguaw, 1999).

Joint decision making plays a pivotal role in enhancing coordination between the suppliers and the firm, integrated supply chain systems this makes it easy for the firm to easily involve its suppliers in decision making this highly contributes to time

saving and thus enhancing profitability of a firm. Supply chain performance leads to profitability of a firm. Barman, Hanna and LaForge (2001) explains that efficient supply chain networks leads to reduction and this improves savings in operations and functions of an organization leading to increased profitability (Frohlich and Westbrook, 2001).

Efficient supply chains improves the functions of supply chain networks, this leads to better delivery systems which increases the quality of goods and services supplied by a firm. When the management of a firm is able to manage the supply chain systems, the suppliers and the customers are able to coordinate their activities efficiently and this helps in saving time and communication costs between the supply chain partners within the supply chain network (Neely and Lewis, 2005).

2.4 Measures of Performance of Supply Chain Performance

Performance measurements play an instrumental role in planning, evaluation of supply link, measuring the level of productivity, evaluation of delivery, measures for delivery performance, total distribution costs and measuring customer service and satisfaction. It is clear that the way the orders are generated and scheduled determines the performance of downstream activities and inventory levels. The first step in assessing performance involves analyzing the manner in which the order related activities are carried out. (Rushton and Oxley, 1991).

The most important issues such as the order-entry method, order lead-time are essential in attaining an efficient supply chain system. An effective performance evaluation of buyer and suppliers is not enough but the extent of this partnership between them needs to be evaluated and improved. More efforts are needed in defining the partnership in the supply chain network with the objective of achieving efficiency and speed (Stewart, 1995).

Once the orders are planned and the goods are sourced, the next step is to make and assemble them. The performance of make and assemble has a major impact on product cost, quality, speed of delivery, and on time delivery reliability and flexibility (Mapes et al., 1997; Slack et al., 1995). As an important part of SCM, the

performance of the production process also needs to be measured, managed and improved to establish suitable measures for measuring supply chain performance.

According to Mapes et al. (1997), a company that manufactures a wide range of products is likely to introduce new products at a slower rate than companies with a narrow product range. Based on a statistical analysis of “UK Best Factory Awards Database,” these authors show that plants that manufacture a wide range of products are likely to perform poorly on added-value per employee, speed and delivery reliability. Furthermore, a company with an extensive product portfolio less frequently breeds new products of innovation. This indicates the impact of “product range” on supply chain performance, and so, it needs to be measured. The same analysis can be applicable for service industries.

The link in a supply chain that directly deals with customers is the delivery of goods and services. This is called driver of customer satisfaction (Stewart, 1995). However, by its very nature, delivery operates in a dynamic and ever-changing environment, making the analysis and subsequent improvement plan of a distribution system difficult. This is not an easy task to appreciate how a change in one of the key elements of a distribution structure affects the system as a whole (Rushton and Oxley, 1991).

Measures for instance delivery performance evaluation, delivery channel, vehicle scheduling, and warehouse location play an important role in delivery performance. It is important to note that an increase in delivery performance is possible by selecting suitable channel, scheduling and location policies. A survey conducted by Gelders et al. (1994) in Belgium shows that tremendous opportunities exist to improve the supply chain performance based on lead-time reduction in the delivery process. What is needed, according to Gelders et al.(1994), is an understanding of the link between delivery channels and organizational operating schedules.

Another important aspect of delivery performance is on-time delivery. This determines whether a perfect delivery has taken place or not, and it acts as a measure of customer service level. Stewart (1995) identifies the following as the measures of delivery performance: delivery-to-request date; delivery-to-commit date; and order fill lead-time. The effectiveness of this has a significant impact on the performance of a

supply chain. For example, scheduling based on JIT has tremendous influence on inventory levels. Similarly, computer generated schedules based on systems like MRP, and more recently ERP, provide a detailed and accurate bill of materials. These impact the effectiveness of purchasing, throughput time and batch size.

Slack et al, (2005) argues that, perhaps the most important research concerning logistics that is going on is in the area of designing efficient and cost-effective distribution systems. Therefore, a thorough understanding and a good performance evaluation of total distribution costs are essential. A profile consisting of various distribution cost elements should be developed so that appropriate trade-offs can be applied as a basis for planning and reassessment of distribution systems, and thus, the overall cost effectiveness can be achieved. For example, an increase in the number of depots and its effects on other distribution costs can be estimated. Using economies of scale, the optimal number of depots that corresponds to minimum total distribution cost can be obtained.

Since customers are from as far as other corners of the globe, without a satisfied customer, the whole exercise of applying the supply chain strategy could be costly and futile. For effective performance measurement, supply chain metrics must be linked to customer satisfaction (Lee and Billington, 1992). This measurement is needed to integrate the customer specification in design, to set the dimensions of quality, for cost control, and as a feedback for the control of process. The following sub-sections discuss the related performance metrics.

2.5 Supply Chain Management Theory

The theory of supply chain management was propounded by Kemppainen and Vepsalainen (2003). The challenges facing SCM as theory and practice stem from their interplay and misalignment. Research shows that there are substantial gaps between theory and practice, one of the challenges facing most organizations across the world is managing supply chain systems that are efficient for the organization to serve the growing needs of its customers. The organization should have a separate function independent of the existing array of functions which are partially but not only full involved such a developed function might act as the arbitrate or of supply and demand Alternatively, some commentators suggest the need to redefine the

purchasing role (Shapiro and Hameri, 2004). A related challenge is to increase the scope of SCM involvement the arc of integration (Frohlich and Westbrook, 2001). This can only be achieved if the enablers identified above are harnessed more effectively the greater transparency of information and knowledge, the formation of appropriate relationship, and the design and use of appropriate measurements.

Current research shows that most organizations are investing in modern supply chain management systems in order to improve efficiency and cost reduction. Some organizations have adopted business models that are compatible with modern supply chain management systems to improve integration and improved communication within the organization and the suppliers. Croom and Roman (2000), argues that supply chain management is seen as part of a wider set of trends involving outsourcing, cross-boundary working, new organizational forms characterized by flattened hierarchies, teams, empowerment and so on rather than rigid command and control. These trends present an opportunity for the development of SCM. Second, the trend towards outsourcing and the increasing importance of intangibles heightens the need for, and the potential of, supply chain management (Davis, 1993).

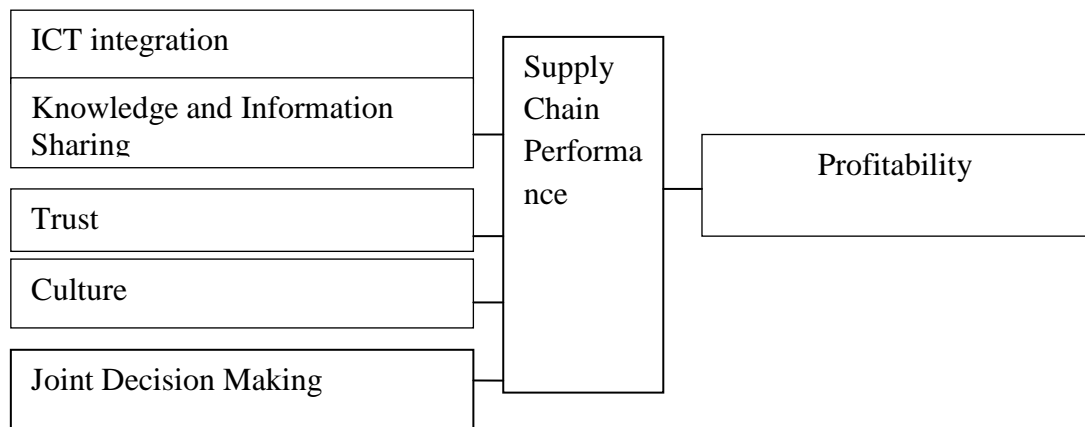
2.5 Summary of the Literature Review

On the gap analysis and the various contributions made by different researchers, this study seeks to achieve two objectives namely: to determine the measures of supply chain performance employed by commercial banks in Kenya, to establish the relationship between supply chain performance and profitability of commercial banks in Kenya. A summary of the literature review depicts the conceptual model of the study that is captured in the figure below:

2.6 Conceptual Framework

Independent variables

Dependent variable



Source: (Researcher, 2014)

Above is the conceptual framework of this study showing the relationship between the independent variables (Determinants of supply chain performance), supply chain performance and profitability of commercial banks in Kenya.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology that was applied in conducting the study. It discusses the research design, target population, sampling design and sample size, data collection and data analysis.

3.2 Research Design

This study involved the use of a descriptive survey. Mitchell and Jolley (2013), asserts that a survey is a means of collecting information about a large group of elements referred to as a population. A survey has three characteristics: to produce quantitative descriptions of some aspects of the study population in which case it is concerned either with relationships between variables, or with projecting findings descriptively to a predefined population; data collection is done by asking people structured and predefined questions and data is collected from a fraction of the target population (Singh & Nath, 2010).

3.3 Population

The population of the study was all the commercial banking institutions operating in Kenya. Central Bank of Kenya (2013) indicates that there were 43 licensed commercial banks as at 13th December 2013. The 43 commercial banks were therefore the target population of the study.

3.4 Data Collection

The study used both primary and secondary data sources. Primary data was collected from supply chain managers of all the 43 commercial banks in Kenya or other persons carrying the same responsibility. Supply chain managers or their equivalents were considered appropriate since they understand better the measures of performance of supply chain among commercial banks. The data was collected by use of a semi structured questionnaire that was administered by drop and pick later method. With a questionnaire, large amounts of data can be collected from a large number of people in a short period of time and in a relatively cost effective way, data can easily be quantified, it can be used to compare and contrast other research and may be used to

measure change. This makes it difficult to affect validity and reliability of collected data. The questionnaire contains three sections: part I addressed the second objective of the study by seeking data on the determinants of supply chain performance among commercial banks in Kenya and part II measures of supply chain performance part III addressed the third objective of the study which is to establish the relationship between supply chain performance and profitability of commercial banks. To achieve the second objective of the study, the researcher used a cross sectional research design to test whether there is any relationship between supply chain performance and profitability of commercial banks in Kenya. Data was captured by the use of a Likert scale.

3.5 Data Analysis

The data was collected sorted and coded using an Statistical Packages for Social Sciences. Descriptive statistics was used to establish the main determinants of supply chain performance among commercial banks in Kenya. Regression analysis was used to explain the relationship between supply chain performance and profitability of commercial banks in Kenya. $S = a + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + e$. Where: S= Profitability; a= the S intercept when x is zero; $b_1, b_2, b_3,$ and $b_4,$ are regression weights attached to the variables; x_1 =ICT integration; x_2 = Knowledge and information Sharing; x_3 =Trust; x_4 =Culture; x_5 = Joint decision making, **a** and **b** are regression constants, **e** is the error term.

The findings were presented in tables and bar charts. The first objective of the study used descriptive analysis like mean and standard deviation to determine the main determinants of supply chain performance among commercial banks in Kenya.

CHAPTER FOUR: DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

Analysis of data is a process of inspecting, cleaning, transforming and modelling data with the goal of highlighting useful information, suggestions, conclusions and supporting decision making. Data analysis has multiple facets and approaches which encompass diverse techniques under a variety of names, in different business, science and social science domains (Mugenda, 1999). Data was collected by use of questionnaires. Data generated was analyzed by use of factor analysis and a regression model fitted. The data was analyzed using SPSS and interpreted according to the research questions which were summarized into frequency tables. The response rate was 100%.

4.2 The Main Determinants of Supply Chain Performance among Commercial Banks in Kenya

4.2.1 Descriptive Statistics

The first output from the analysis is a table of descriptive statistics for all the variables under investigation. The statistics include the mean, standard deviation and number of respondents (N) who participated in the survey. The findings are presented in Table 4.1

Table 4.1 Descriptive Statistics

| | Mean | Std. Deviation | Analysis N |
|------------------------------------|-------------|-----------------------|-------------------|
| ICT AND INTEGRATION | 3.62 | .223 | 43 |
| JOINT PLANNING AND DECISION MAKING | 2.80 | .241 | 43 |

| | | | |
|-----------------------------------|------|------|----|
| KNOWLEDGE AND INFORMATION SHARING | 3.52 | .379 | 43 |
| TRUST | 3.42 | .400 | 43 |
| CULTURE | 3.58 | .246 | 43 |

From table 4.1, the highest determination is between ICT and integration, which has a mean of 3.62 which is the highest while other critical determinants are culture has a mean of 3.58 and joint planning 3.42, information sharing at 3.52, trust at and decision making with the least mean of 2.80. ICT and integration is the largest determinant of supply chain performance.

4.2.2 The Relationship between the Determinants and Supply Chain Performance

The relationship between the independent variables and the supply chain performance were measured using correlation analysis. A correlation matrix is a rectangular array of numbers which gives the correlation coefficients between a single variable and every other variable in the investigation.

The correlation coefficient between a variable and itself is always 1, hence the principal diagonal of the correlation matrix contains 1s. The correlation coefficients above and below the principal diagonal are the same.

The findings are presented in table 4.2

Table 4.2: The Correlation Matrix

| | ICT AND INTEGRATION | JOINT PLANNING AND DECISION MAKING | KNOWLEDGE AND INFORMATION SHARING | TRUST | CULTURE | SUPPLY CHAIN PERFORMANCE |
|------------------------------------|---------------------|------------------------------------|-----------------------------------|-------|---------|--------------------------|
| ICT AND INTEGRATION | 1.000 | .480 | .406 | .558 | .373 | .367 |
| JOINT PLANNING AND DECISION MAKING | .480 | 1.000 | .664 | .583 | .579 | .556 |
| KNOWLEDGE AND INFORMATION SHARING | .406 | .664 | 1.000 | .710 | .641 | .636 |
| TRUST | .558 | .583 | .710 | 1.000 | .430 | .419 |
| CULTURE | .373 | .579 | .641 | .430 | 1.000 | .884 |
| SUPPLY CHAIN PERFORMANCE | .367 | .556 | .636 | .419 | .884 | 1.000 |

There is a positive relationship between the supply chain performance which measures profitability and the independent variables which are ICT and integration with a co-efficient of correlation of 0.367. the co-efficient of correlation between the supply chain performance and joint planning and decision making, knowledge and information sharing, trust and culture are 0.556, 0.636, 0.419 and 0.884 respectively. Culture has the highest relationship with the supply chain performance.

Measures strength of the relationship among variables was established using the KMO and Bartlett's Test. The **KMO** measures the sampling adequacy which should be greater than 0.5 for a satisfactory factor analysis to proceed. If any pair of variables has a value less than this, one of the variables is dropped from the analysis. The off-diagonal elements should all be very small (close to zero) in a good model. **Bartlett's test** is another indication of the strength of the relationship among variables. This tests the null hypothesis that the correlation matrix is an identity matrix. An identity matrix in which all of the diagonal elements are 1 and all off diagonal elements are 0.

Table 4.3: KMO and Bartlett's Test

| | | |
|--|--------------------|---------|
| Kaiser-Meyer-Olkin Measure of Sampling Adequacy. | | .790 |
| | Approx. Chi-Square | 155.398 |
| Bartlett's Test of Sphericity | df | 15 |
| | Sig. | .000 |

The KMO measure is 0.79. A common rule is to suggest that a researcher has at least 10-15 participants per variable. Fiedel (2005) says that in general over 300 cases for sampling analysis is probably adequate. There is universal agreement that factor analysis is inappropriate when sample size is below 50. Kaisen (1974) recommend 0.5 as minimum (barely accepted), values between 0.7-0.8 acceptable, and values above 0.9 are superb. From the test the results are acceptable. The **Bartlett's test** of sphericity is significant That is, its associated probability is less than 0.05. In fact, it is actually 0.012, i.e. the significance level is small enough to reject the null hypothesis. This means that correlation matrix is not an identity matrix.

4.3 The Relationship between Supply Chain Performance and Profitability

A regression model will be used to achieve the second objective of the study by testing the relationship between supply chain performance and profitability of commercial banks in Kenya.

Table 4.6: Regression Analysis

| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1 | .890 ^a | .792 | .763 | .38201 |

a. Predictors: (Constant), CULTURE, ICT AND INTEGRATION, TRUST, JOINT PLANNING AND DECISION MAKING, KNOWLEDGE AND INFORMATION SHARING

Table 4.6 presents that the R-Squared is 0.792. This implies that 79.2% of the variances in the supply chain performance can be explained by variances in culture, ICT and integration, trust, joint planning and decision making and knowledge and information sharing. However, 21.8% is explained by other variables.

4.3.1 Significance of the Model

| Model | | Sum of Squares | df | Mean Square | F | Sig. |
|-------|------------|----------------|----|-------------|--------|-------------------|
| 1 | Regression | 20.507 | 5 | 4.101 | 28.105 | .000 ^b |
| | Residual | 5.400 | 37 | .146 | | |
| | Total | 25.907 | 42 | | | |

a. Dependent Variable: SUPPLY CHAIN PERFORMANCE

b. Predictors: (Constant), CULTURE, ICT AND INTEGRATION, TRUST, JOINT PLANNING AND DECISION MAKING, KNOWLEDGE AND INFORMATION SHARING

The model is significant as shown by the F- test and the F- value of 28.105, the P- value is 0.000 which indicates the statistical significance of the model.

4.5 The Model Specification

| Model | | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|---|------------------------------------|-----------------------------|------------|---------------------------|-------|------|
| | | B | Std. Error | | | |
| 1 | (Constant) | 6.227 | 2.419 | | 2.575 | .014 |
| | ICT AND INTEGRATION | .121 | .331 | .034 | .364 | .718 |
| | JOINT PLANNING AND DECISION MAKING | .054 | .356 | .016 | .150 | .881 |
| | KNOWLEDGE AND INFORMATION SHARING | .285 | .273 | .138 | 1.047 | .302 |
| | TRUST | .098 | .234 | .050 | .417 | .679 |
| | CULTURE | 2.537 | .329 | .795 | 7.716 | .000 |
| a. Dependent Variable: SUPPLY CHAIN PERFORMANCE | | | | | | |

$$Y = 6.227 + 0.121X_1 + 0.054X_2 + 0.285X_3 + 0.098X_4 + 2.53X_5 + 0.38201$$

$$S.E = 2.419 \quad 0.331 \quad 0.356 \quad 0.273 \quad 0.234 \quad 0.329$$

$$T \text{ Stat} = 2.575 \quad 0.364 \quad 0.150 \quad 1.047 \quad 0.417 \quad 0.7716$$

$$\text{Sig} = 0.014 \quad 0.718 \quad 0.881 \quad 0.302 \quad 0.679 \quad 0.000$$

Holding other factors constant a unit increase in ICT and integration causes a 12.1% increase in the supply chain performance. Similarly a unit increase in joint planning and decision making causes a 5.4% increase in the supply chain performance. Holding other factors constant a unit increase in knowledge and information sharing causes a 28.5% increase in the supply chain performance. Similarly a unit increase in trust causes a 9.8% increase in the supply chain performance. Similarly increase in culture causes a 25.3% increase in the supply chain performance. Therefore all the variables have an effect on the supply chain performance.

The highest influence of supply chain performance is therefore knowledge, information sharing. It is closely followed by culture and ICT and integration. The least influence is joint planning and trust. Supply chain performance is affected by knowledge and information sharing, culture, ICT and integration.

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary of the findings of the main study, conclusions and recommendations arrived at. It also gives suggestions for further studies.

5.2 Summary and Conclusion

The study was to investigate the determinants of supply chain performance among commercial banks. It was guided by two objectives to establish main determinants of supply chain performance in commercial banks and to establish the relationship between supply chain performance and profitability in commercial banks in Kenya. The research carried out a census on the 43 commercial banks operating in Kenya.

An ICT tool (ERP) enhances the performance of the entire supply chain to make it less troublesome (Frohlich and Westbrook, 2001). ICT integration had the highest mean and there was a correlation between ICT integration and supply chain performance. This is consistent with the findings by Ambrose who noted that of late, ICT tools have been used to ensure efficient and effective performance of supply chain (Ambrose et al., 2008).

Dixon (2012) explained that supply chain management challenges have increased globally due to the turbulent nature of the environment due to risks and uncertainties. Trust had a high mean and a positive relationship between trust and supply chain performance. One of the most critical factors in a committed and collaborative relationship between supply chain partners is trust. Trust between the firm and its supplier's leads to a successful supply chain relationship; if not, transaction costs can rise through poor performance (Aulakh, et al, 1996).

Barney (1986) explains that the culture of an organization strengthens the relationship between the suppliers and the organization since they understand the processes and procedures when seeking to deliver goods and services to a customer. This is consistent with the findings of the research where there is a co-efficient correlation of 0.884 which was the highest among all the independent variables. Nyamu (2012) argued that supply chain challenges are mostly attributable lack of information sharing which play a critical role in enhancing communication within supply chain partners to facilitate faster decision making. Information should be shared and distributed timely within supply chain channels.

There are various determinants of supply chain performance that contributes to efficient and effective performance of supply chain in the organization namely ICT, knowledge and information sharing, trust, culture and joint decision making (Hatry, 2006). The Bartlett's test was 0.000; the significance level is so low the null hypothesis is rejected. All the variables that are tested are significant. All the independent variables in the study influenced supply chain performance at 74.6% with the highest influence being the knowledge and information sharing and the least being ICT and integration. The R-squared was above 50% and using the Analysis of Variance the relationship was significant and the P-Value is 0.000.

5.4 Recommendation

Banks should involve their employees more in the supply chain performance of the commercial banks. Supply chain performance should be adopted because it improves the profitability of banks.

Organizations and people in organizations respond to measures. The right measures not only offer a means of tracking whether organization's objectives are being

implemented, but also a means of communicating strategy and encouraging its implementation.

Right Supply Chain Performance Measurement is vital for effectiveness and sustenance of Supply Chain. For the SCs to be successful its members must shift their focus from individual-member performance to SC performance and this requires integration. Trust, commitment and communication between the SC members (managers) are critical to achieve integration (Sambasivan et al., 2009). The performance measures and metrics must reflect these initiatives.

Companies need a structured method or framework to audit existing performance measurement systems (Medori et al., 2000). Managing the variance in a SC system may be more important to an organization's financial performance than managing average (William et al., 2007).

5.5 Suggestions for Further Research

Further studies may be conducted to map our studies with other companies for supply chain efficiency, cost management and reliability. There is a need for further research in the area of SCPMS. More research to explore how these conceptual frameworks can be translated and tailored to fulfill the unique needs of a specific organization will result in effective measurement systems for future SCs.

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APPENDIX I: QUESTIONNAIRE

Instructions

All the information received will be treated confidentially and will only be used for academic purposes.

Part I

i. The name of the Bank

ii. Ownership.....

iii. Year of Establishment.....

Part II. Determinants of Supply Chain Performance

Using the scale below, please indicate the extent to which you agree or disagree with the statements below.

| Not at all | To a little extent | To a moderate extent | To a great extent | To a very great extent |
|------------|--------------------|----------------------|-------------------|------------------------|
| 1 | 2 | 3 | 4 | 5 |

ICT and Integration

| | | |
|---|---|-----------|
| 1 | The banks has integrated its supply chain systems | 1 2 3 4 5 |
| 2 | Communication costs | 1 2 3 4 5 |
| 3 | Efficiency in supply chain management | 1 2 3 4 5 |
| 4 | Quality of services | 1 2 3 4 5 |
| 5 | Speed in delivery of services | 1 2 3 4 5 |

Joint Planning and Decisions Making

| | | |
|---|--|-----------|
| 1 | Supplier involvement in decisions | 1 2 3 4 5 |
| 2 | Cooperation between the bank and its suppliers | 1 2 3 4 5 |
| 3 | Improved quality | 1 2 3 4 5 |
| 4 | Stock out costs | 1 2 3 4 5 |
| 5 | Lead times | 1 2 3 4 5 |

Knowledge and Information Sharing

| | | |
|---|---|-----------|
| 1 | Procurement decisions | 1 2 3 4 5 |
| 2 | Decision making processes | 1 2 3 4 5 |
| 3 | Communication between upstream and downstream | 1 2 3 4 5 |
| 4 | Reponses and feedback | 1 2 3 4 5 |
| 5 | Service delivery | 1 2 3 4 5 |

Trust

| | | |
|---|--|-----------|
| 1 | The bank maintain trusts with its suppliers | 1 2 3 4 5 |
| 2 | The bank suppliers are reliable | 1 2 3 4 5 |
| 3 | Confidentiality between suppliers and the bank | 1 2 3 4 5 |
| 4 | Confidence between supply chain partners | 1 2 3 4 5 |
| 5 | Working relationships between the bank and the suppliers | 1 2 3 4 5 |

Culture

| | | |
|---|--|-----------|
| 1 | Culture accommodates supply chain flexibility | 1 2 3 4 5 |
| 2 | Top management support | 1 2 3 4 5 |
| 3 | Cooperation between the management and employees | 1 2 3 4 5 |
| 4 | Employees are willing to comply with set rules | 1 2 3 4 5 |
| 5 | Culture strengthens relationship with existing suppliers | 1 2 3 4 5 |

Part III: Measures of Supply Chain Performance

Please indicate the extent to which you concur with the following statements concerning the Measures of Supply Chain Performance used by commercial banks. Use the scale of: 1= Strongly agree 2= Agree 3= Undecided 4= Disagree 5= Strongly disagree.

| No | Statement | 1 | 2 | 3 | 4 | 5 |
|----|--|---|---|---|---|---|
| 1 | Communication costs between the firm an suppliers) | | | | | |
| 2 | Lead time | | | | | |
| 3 | Supply chain networks | | | | | |
| 4 | Holding costs | | | | | |
| 5 | Stock out costs | | | | | |
| 6 | Supply chain performance leading to increased market share | | | | | |
| 7 | In general, there is increased productivity | | | | | |

13. Any other? Please indicate.

.....

Part IV: The Relationship between Profitability and Supply Chain Performance

Relationship between Profitability and Supply Chain Performance by commercial banks. Please provide an estimate of the following figures as provided below:

| No | Statement | 2013 |
|-----------|-----------------------|-------------|
| 1 | Return on Investments | |
| 2 | Sales | |
| 3 | Reduction in Cost | |
| 4 | Revenue | |
| 5 | Return on Assets | |

THANK YOU FOR YOUR TIME

Appendix II: Licensed Commercial Banks in Kenya

1. African Banking Corporation
2. Bank of Africa
3. Bank of Baroda
4. Bank of India
5. Barclays Bank of Kenya
6. Cfc Stanbic bank
7. Chase bank
8. Charter House Bank(Under statutory Management)
9. Citibank
10. Credit Bank
11. Co-operative bank of Kenya
12. Commercial Bank of Africa
13. Consolidated bank
14. Development bank of Kenya
15. Diamond Trust bank
16. Dubai bank
17. Eco bank
18. Equatorial Commercial Bank
19. Equity bank
20. Family bank
21. Fidelity Commercial bank
22. Fina bank
23. First Community Bank
24. Giro commercial bank
25. Guardian bank
26. Gulf African Bank
27. HabibA.G.Zurich
28. Habib bank
29. Imperial Bank
30. Investment and Mortgages bank
31. K-Rep bank
32. Kenya Commercial bank

33. Jamii Bora Bank
34. Middle East bank
35. National bank of Kenya
36. National Industrial Credit bank
37. Oriental Commercial bank
38. Paramount Universal bank
39. Prime Bank
40. Standard Chartered bank
41. Trans-National bank
42. UBA Kenya Limited
43. Victoria Commercial bank

Source: Central Bank of Kenya (CBK), 2013