

**Branice Ashioya**

# Balanced Scorecard and Supply Chain Performance. The Case of the Kenya Nut Company

Master's Thesis

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**THE BALANCED SCORECARD AND SUPPLY CHAIN  
PERFORMANCE: A CASE OF KENYA NUT COMPANY**

**ASHIOYA INDEKHWAN BRANICE**

**A MANAGEMENT RESEARCH PROJECT SUBMITTED IN  
FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE  
DEGREE OF MASTER OF BUSINESS ADMINISTRATION (MBA) SCHOOL OF  
BUSINESS, UNIVERSITY OF NAIROBI**

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## **ABBREVIATIONS**

BSC-Balanced Scorecard

KNC-Kenya Nut Company

SCP-Supply chain performance

SCM-Supply chain management

## **ABSTRACT**

The study sought to determine the Balanced Scorecard measures on supply chain performance at Kenya Nut Company. The objectives of the study were to establish the extent to which the BSC measures have been used at KNC and the challenges faced in implementing the BSC. The research design involved a case study of employees at KNC .Data was collected using a questionnaire that was administered through a drop and pick method. Tables, graphs and regression analysis were used to present the findings. The study established that the BSC measures are greatly used to establish the supply chain performance at KNC. Some of the measures that are extensively used include percentage of sales margin, profit margin, range of products offered, accuracy of forecasted demand, level of partnerships with suppliers among others. It was also established that some critical measures have not been intergrated into the organization. These measures can greatly improve the performance of KNC and overcome its challenges of slow production growth, lack of customer awareness, poor information systems and high processing costs. This measures include return on supply chain assets, cost per operation hour, order lead time, product development life cycle.

The study also established some of the challenges faced in implementing the BSC such as too much time in developing and updating the BSC, too many measures being used and difficulty in determining the measures. . It was also clear that there was a very significant relationship between BSC measures and supply chain performance represented by  $R^2$  value of 0.73 which translates to 73% variance explained by the four independent variables of financial measures, customer satisfaction, internal business processes, learning and growth.

Further research can be done on the same study but to a wider group of companies to establish whether the BSC measures are used. It has also been recommended that other organizations embrace the BSC measures to embrace the benefits such as product leadership, improved flexibility, and increased information capital among others. The challenges affecting KNC in implementing the BSC should be monitored so that KNC can fully adopt the BSC in its supply chain.

# **CHAPTER ONE**

## **INTRODUCTION**

### **1.1 Background of the Study**

As businesses evolve into the 21<sup>st</sup> century, the management focus driving most organizations is supply chain superiority (Brewer & Speh, 2000). Supply chain management is becoming a necessity in the competitive marketplace hence the need to have performance measurement tools that can lead to successful supply chains. The balance scorecard (BSC) proposed by Kaplan & Norton (1996) is a performance evaluation tool that includes non-financial perspectives such as customer ,internal business process, and learning and growth perspectives, as well as the financial perspective to give managers a balanced view of overall organizational performance. It strikes a balance between financial and non-financial measures thereby enabling organizations to achieve holistic supply chain excellence. The BSC was developed as an enhancement to the previously traditional methods of measuring performance such as return on investment (ROI), payback period and net present value (NPV). The traditional methods majored on financial aspects of a firm ignoring other performance indicators. They followed financial accounting principles without any forward-looking perspective and measurement was restricted directly to measurable indicators only (Horvath, 1996). This was unrealistic in modern supply chain management applications, where a performance measurement system has to take into account a wider range of controlling targets such as customers requiring a range of benefits that are both tangible and intangible (Bhagwat & Sharma, 2007).

Performance measurement is the process of quantifying effectiveness and efficiency of organisational functions (Neely, Gregory & Platts, 1995). Neely (1996) also explained that performance measurement refers to the use of a multi-dimensional set of performance measures that includes both financial and non-financial measures that quantify what has been achieved as well as measures that help predict the future. Therefore, supply chain performance measurement is the process of determining the productivity of the whole supply chain from suppliers to consumers involving functions such as inventory management, transportation, customer service, storage, delivery and order fulfillment. In today's world, supply chain excellence is more than just reduced costs. It also includes better customer service, reduced lead times, advancement in technology hence the need of performance measurement systems that can capture all the required data (Brewer & Speh, 2000).

### **1.1.1 Balanced Scorecard**

The BSC has received a great deal of attention as it integrates financial and nonfinancial performance measures to help organizations in the learning and improvement of their internal and external processes (Ababneh, 2008). The BSC has four perspectives: the innovative and growth perspective which measures how an organization improves and introduces new products, the internal business perspective which measures the effectiveness of the organizations processes, the customer perspective measures how the customer perceives the value created by the organization, while the financial perspective measures growth and return on investments provided by the organization to shareholders.

The balanced scorecard was developed to address weaknesses associated with traditional performance measurement systems including providing a holistic approach as it addresses both the financial and non-financial aspects unlike the traditional performance measurement tools. It is designed to help firms that have overemphasized on short term financial performance (Brewer & Speh, 2000). It tracks financial results as well as monitoring the process of building capabilities and acquiring assets for future growth (Kaplan & Norton, 1996). Prior traditional measurement systems cannot capture the measurements that are needed in the modern companies today. High quality services ,intellectual capital ,skilled employees and responsiveness are intangible assets that are important but cannot be captured in the balance sheet hence customers, shareholders and the management cannot know the real worth of a company (Chavan, 2009). In addition, developing a world class performance measurement system hinges on a clear understanding of a firm`s competitive strategy, operational goals and the employee competencies required to achieve the firm`s objectives (Becker, 2011). Performance measurement systems can therefore only create value when they are matched with the firms operational goals. The BSC aligns the performance measures with the objectives of the organization. According to Kaplan and Norton (1996) the objectives and measures of the BSC are consistent and mutually reinforcing rather than a collection of financial and non-financial measures that are unrelated.

### **1.1.2 Supply Chain Performance**

According to Chan (2003) performance measurement describes the feedback or information on activities with respect to meeting customer expectations and strategic objectives. The purpose of a performance measurement system is to ensure that standards and objectives are

set clearly, performance is regularly and objectively assessed for accomplishments, and that actions are taken to improve and enhance performance potential in the future (Ababneh, 2008). The basis of competition for winning companies in today's economy is supply chain superiority (O'Marah, 2000). With organizations seeking benefits of shorter lead times, responsiveness, flexibility and shorter product development cycles, excellence in supply chain performance is inevitable.

Alazab A., Alhyari, Alazab M. and Venkatraman, (2010) found that a good performance measurement system should be able to provide to all stockholders where they are, how the organization is doing and where the organization is going. Measuring supply chain performance can therefore facilitate a better understanding of the supply chain, positively influencing supply chain partners and improving its overall performance (Chen & Paulraj, 2004). Supply chain performance measurement systems are essential for better decision making by management and good communication across the entire supply chain including supply chain partners and employees. Performance measures enable a more open and transparent communication between people leading to a co-operative work environment hence improved organizational performance (Gunasekaran & Kobu, 2007). Performance measurement systems are also necessary tools required to support decision making (Berrah & Cliville, 2007). Moreso, supply chain measurement systems ensure timely feedback of information enabling the organization to correct or improve processes in the supply chain. Performance measurement provides information for management feedback for decision makers thereby assisting in directing management attention, revising company goals and re-engineering business processes (Thakar, Marwah & Gupta, 2012).

### **1.1.3 Kenya Nut Company**

Kenya Nut Company (KNC) is a Thika-based Kenyan company formed in 1972 and one of the leading producers of macadamia nuts worldwide (<http://www.kenyanut.com>, 4<sup>th</sup> June 2013). The company was appointed by the Government of Kenya to spearhead and invest in the development of macadamia nut industry in Kenya (Mbora, Jamnadass & Lilleso, 2008). KNC has a vertically integrated supply chain that ensures a continuous chain of the products such as macadamia nuts, organic nuts, coffee and cashew nuts from suppliers to the final consumer.

According to the Food and Agriculture Organization as cited by Mogeni (2012) macadamia nuts production in Kenya is high, earning the country over Ksh.1billion every year. However, KNC faces challenges of slow production growth, lack of customer awareness, poor information systems and high processing costs in its supply chain. The BSC can improve the supply chain by overcoming the challenges faced through the use of financial, customer, internal business, and learning and growth perspectives. The main purpose of this research is to demonstrate the extent to which KNC uses the BSC in its supply chain.

## **1.2 Statement of the Problem**

The BSC has been applied successfully in organizations in the USA and many thriving applications have been documented (Tonge, 1996). A range of benefits have been attributed to the BSC in supply chain management, including reduced costs, increased market share and sales, and solid customer relations (Ferguson, 2000). Nevertheless, many companies have not succeeded in maximizing their supply chain's potential because they have often failed to develop the performance measures needed to fully integrate their supply chain to maximize effectiveness and efficiency (Gunasekaran, McGaughey, Patel & Ronald, 2004). KNC is one of the companies that is yet to maximize their supply chain performance. With its products being consumed both locally and in international markets such as U.S.A, Japan and Germany, the company still faces challenges that inhibit its performance. Though KNC contributes to the 10,000metric tons of macadamia nuts produced each year in Kenya, the production growth rate has been slow (Gitonga, Muigai, Kahangi, Kamau & Gichuki, 2009). According to Mogeni (2012) there is increasing demand for KNC products from importing countries such as U.S.A,Japan and Germany hence the need to increase production. Between the year 2000 and 2006, U.S.A doubled its local consumption and increased its imports more than four times without changing its production levels thus offering Kenya a huge market potential for macadamia nut (Gitonga et al., 2009). Furthermore, having local competitors such as Jungle nuts and Equatorial nuts as well as in other countries such as South Africa and Guatemala (Cabi, 2005), there is need for the company to implement performance measures that ensure world class performance. World Horticultural Trade and U.SA Export Opportunities (2002) indicated that KNC faces challenges relating to lack of consumer awareness, poor information systems, low purchasing power, high prices due to high processing costs and lack of government support as the government puts more emphasis on other food products such as tea, sugar and coffee.

KNC can overcome these challenges by having a BSC that can improve its functions such as sourcing, production, storage, packaging and distribution in the supply chain that relate to the challenges. For example, the BSC can overcome the challenge of high processing costs through the internal business perspective by having measures such as reduced order cycle time and efficient capacity utilization. An all rounded approach of the BSC can be used to capture the required production capacity, partnerships with stakeholders such as the Kenyan government, technological and demand capacity.

There has been literature on the balanced scorecard in various service industries such as telecommunications where the BSC is used in performance measurement at Essar Telecom Kenya Limited, (Nyaega, 2006), BSC in healthcare organizations (Gurd & Gao, 2007) and hospitality industries (Denton & White, 2000). The literature did not cover the BSC in manufacturing industries and specifically the food industry .In addition, there is little evidence of the BSC in regard to supply chain management. Brewer and Speh (2000) provided a modified version of the BSC to measure supply chain performance in totality and not within a specific industry. (Wongrassamee, 2003) notes that the BSC is not a template that can be applied to business in general or even industry wide due to different market situations, different product types and competitive environments that require different scorecards. Hence there is need to determine the BSC measures that are specific to the supply chain at KNC. Bigliardi and Bottani (2010) developed the BSC for the supply chain in food companies. The case studies exploited in the paper validated the BSC model, but did not investigate its implementation in factual cases. The recommendations on the paper further suggested applying the model to test its suitability in a wide range of food companies. The study did not focus on the BSC in food companies in the Kenyan market. The research questions for this study include include ,what is the extent to which the BSC measures are used in KNC ,what is the relationship between the BSC and supply chain performance at KNC and what are the challenges faced in implementation of the BSC at KNC ?

### **1.3 Objectives**

- i. To determine the extent to which the balanced scorecard measures are used on supply chain performance at KNC
- ii. To determine the challenges faced in the implementation of the BSC at KNC.

#### **1.4 Value Of The Study**

The study will be of significance to scholars, academicians, organizations in the food industry and the management and staff at KNC.

The study will assist the management and staff of KNC on how to better improve their supply chain performance using the balanced approach. The management of KNC may also find the study results useful as it will aid in decision making.

The study will be of importance to Scholars and academicians as they will have more knowledge on the relationships between the BSC measures and the supply chain goals. The study will therefore act as a source of reference for scholars and academicians.

In addition, the findings of the study will enable organizations in the food industry to appreciate the challenges and success factors that accrue from the implementation of the balance scorecard in a supply chain



## **CHAPTER TWO**

### **LITERATURE REVIEW**

#### **2.1 Introduction**

This chapter will examine findings from various scholars and authors about the balanced scorecard on supply chain performance. The chapter discusses the balanced scorecard measures relating to financial, customer, internal business, and learning and growth perspectives, challenges faced in the implementation of the BSC and the conceptual framework showing the relationship between the independent and dependent variables.

#### **2.2 Balanced Scorecard**

The balanced scorecard has been used extensively in businesses, industries, government and nonprofit organizations worldwide to align business activities to the vision and strategy of the organization, thereby improving internal and external communications and monitoring organizational performance against strategic goals (Nyaega, 2006).

The BSC is seen as a tool that meets the need for improvement and change especially when venturing into the competitive market. Jacobs and Maiga (2003) argued that the BSC could be considered as a main tool in evaluating organizations comprehensively when dealing with highly changeable environment and as a response to the new global competition. The balanced scorecard has attained significance globally from academicians to industry practitioners. By the year 2000, at least 40% of Fortune 1000 companies were reported to using the balanced scorecard in their performance measurement (Frigo & Krumiede, 2000). A survey done by Bain and Company on more than 708 companies showed 62% of the companies having used the balanced scorecard approach as one of their management tools (Hendricks, Menor & Wiedman, 2009). This signifies the balanced measurement of business processes. Increased competition is thus forcing companies to review ways of becoming more efficient and effective through various performance measures (Gautreau & Kleiner, 2001)

Most researches on the use of the BSC approach have focused on its application within a strategic management context (Jones, Knotts & Udell, 2006). Recent articles have now focused on the BSC in various areas such as supply chain performance management.

According to Chia, Goh and Hum (2009) most of the applications and case studies of the BSC are descriptions of how companies have adopted, created, and implemented the scorecard in their organizations or industry. Park, Lee and Yoo (2005) designed an adapted supply chain performance analysis approach based on the BSC model. The findings state that the BSC can provide insights to supply chain management solutions and product characteristics. Bhagwat and Shamar (2007) developed a balanced scorecard that measures the day to day business operations. The purpose of the study was to see how small and medium sized enterprises applied the BSC concept. From the study, it was concluded that the BSC provides guidance in the evaluation and measurement of supply chain management if it is used on a daily routine. Chia et al. (2009) assessed how different stakeholders along the supply chain perceived performance measurement from a BSC approach. They conducted a survey on how the four perspectives of the BSC are perceived to manufacturers, retailers, international procurement offices and logistics service providers. From the findings, it was clear that the stakeholders agreed to the use of the BSC in improving supply chain performance. They recommended a study on the actual measures adopted by the supply chain entities involved using a BSC approach. Brewer and Speh (2000) provided a modified version of the BSC to measure supply chain performance holistically without emphasis on a specific industry. The empirical paper provided example measures that are but a tiny fraction of the possible measures that can be developed. Cuthbertson and Piotrowicz (2011) state that supply chain performance measurement systems should not be considered as a generic context-independent process, but as a system tailored to the specific supply chain requirements. Bigliardi and Bottani (2010) developed a BSC framework for the supply chain in food companies. Through the interviews developed from the two case studies, it was established that the BSC perspectives are instrumental in the food supply chain. Mbogo (2008) had a case study on how the BSC is used as a continuous improvement tool at Kenya Revenue Authority (KRA). The case study findings established that management had a key role in the BSC implementation, creating strategic awareness and ensuring attainment of organization objectives and goals at KRA. It is thus evident that the BSC has been used both empirically and in literature, however no specific studies have addressed the BSC in the Kenyan food industry specifically in the Kenya Nut Company.

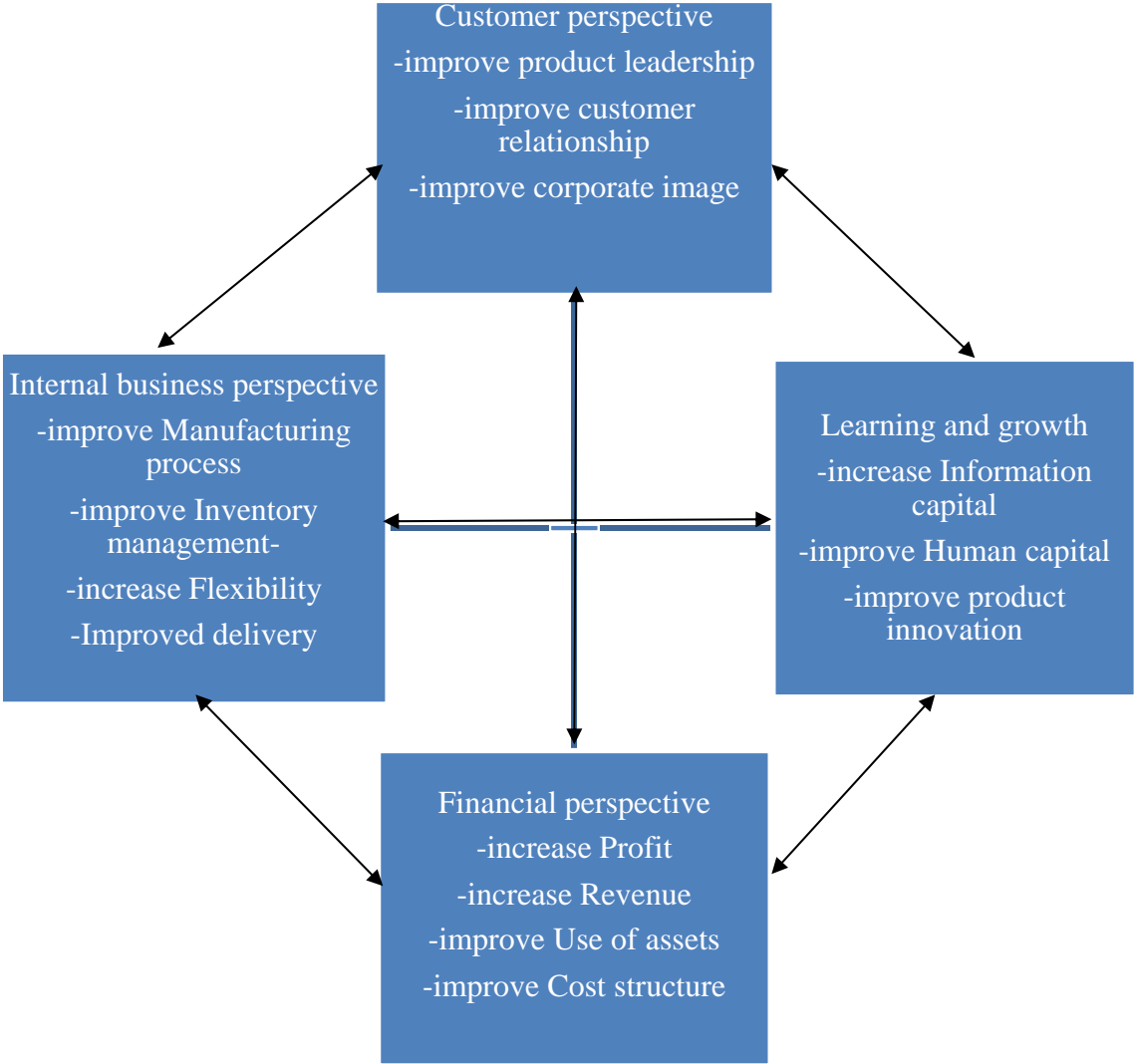
### **2.3 The Balance Scorecard Measures**

Traditional performance measurement tools could not successfully assess supply chain performance (Brewer & Speh, 2000). The appeal of the BSC is its ability to include both traditional financial metrics and non-financial performance measures in its reporting capacity, thus the term balanced (Cabrita, Duarte & Machado, 2011)

The Scorecard allows interconnections and interactions to occur between the four perspectives; financial, customer, internal business, learning and growth. In addition, the goals and measures demonstrate the superiority of the BSC over traditional financial measures in terms of the scope of performance measurement capability (Arik, 2006).

Each perspective of the balanced scorecard includes goals, measures of those goals, targets values of those measures and initiatives (Torrington & Hall, 2008). Goals refer to the major objective to be achieved, measures are the observable parameters that will be used to measure progress toward reaching the goal while targets are the specific target values for the measures, and lastly initiatives are the action programs to be initiated in order to meet the goal (Kaplan & Norton, 1996).

Fig 2.1: The Balance scorecard perspectives



Source: Kaplan and Norton (1996)

**2.3.1 Customer Perspective**

In the customer perspective performance measures are aimed to create tangible results for its customers. One of the changes in business practices dictated by the transition from the industrial age to the information age is the shift of enterprises from being production- and product-focused to being customer-focused (Arik, 2006). Product leadership objective can be achieved through measures such as good product quality and flexibility of products by providing a range of products that the customer wants. The different demands, desires and idiosyncrasies of customers all along the supply chain must be understood and managed effectively (Brewer & Speh, 2000). Leading soft drinks company, Coca-cola quickly cycles consumer needs, trends and tastes thereby having a variety of winning products in the market

(AMR Research, 2004). Good customer relationship can be achieved through measures such as timely delivery of products, customer response time and order lead time. A reduction in the order lead time leads to a reduction in the customer response time hence an efficient supply chain (Gunasekaran et al., 2001). The corporate image objective has measures such as reputation of the company to customers. Satisfying customers can be achieved when the whole supply chain commits, integrates and coordinates to pursue innovative practices (Mehrierdi, 2009).

### **2.3.2 Financial perspective**

At the financial perspective, the overall aim is improving the financial capability of the organization. Fulfilling customers' needs and supply chain partners ensures financial success. Financial superiority is depicted by measures such as increase in sales, cash to cash cycle, profits increase, return on investment and revenue growth. A study to validate the correlation between supply chain integration and business success shows best practice SCM companies have a 45% total supply chain cost advantage over their competitors (Brewer & Speh, 2000). Better services leads to increased revenue growth. Companies participating in Massachusetts information technology's Integrated Supply Chain Management program reported a 17% revenue increase due to better SCM initiatives (Brewer & Speh, 2000). According to Lovett and MacDonald (2005) profit-ability is the key to a firm's ability to remain a viable entity and satisfy its shareholders. It is therefore important to inform consumers of how the firm is doing year after year and actions taken as a way of reflecting financial performance of organizations (Alazab et al., 2010). Cost structure can be measured through cash to cash cycle to know how long it takes to transform cash in assets such as equipments and inventories to cash collected from a customer. Return on investment measures the performance that the top management can achieve on the total capital invested in business. Measuring return on investment enables an organization to have insights about the financial health of the supply chain (Bhagwat & Shamar, 2007)

### **2.3.3 Learning and growth**

In the learning and growth perspective companies continuously grow and innovate to be the best in class in supply chain practices. Firms improve their capability thereby reducing wastes and ensuring flexibility through various ways. The information capital objective has measures that include information sharing which is a key driver for improving supply chain performance and enhancing competitive advantage (Li & Zhang, 2006). Li and Zhang (2006)

continue to state that information sharing is being embraced in organizations through exploring advancements in technology such as use of the internet, intranet, databases, Electronic Data Interchange (EDI), Enterprise Resource Planning (ERP) and Distribution Requirements Planning (DRP) systems to exchange data, information and knowledge along the supply chain and in collaboration with its partners and the government. The internet provides firms a mechanism to exchange information and data more rapidly than traditional communication methods and at a lower cost (Bird, 2000). Accurate and timely information ensures better decision making. Product innovations and redesign also adds value to customers.

The human capital aspect involves talents and skills of the organizations employees and collaboration with its partners too. A company is as good as the people it keeps. Collaborations between the employees, performance management, compensation systems, training and development programs, should be implemented to improve the supply chain (Park et al., 2005). Good relationships with suppliers and partners should also be achieved for better results.

#### **2.3.4 Internal business processes**

In Internal business perspective, firms should decide what processes they must excel at and specify measures for them (Bhagwat & Shamar, 2007). It starts with receipt of a customer order and ends with delivery of the product to the customer (Kaplan & Norton, 1996). Improving inventory management can be achieved through measures such as inventory costs incurred in the supply chain including purchasing, holding, shortage and ordering costs. Flexibility can be achieved through measures that include how the supply chain responds to urgent orders, forecasting demand by understanding customers and their ordering patterns. East African Breweries Limited(EABL) have excelled in inventory management by having demand solutions that are flexible to meet the complex supply chain needs enabling reduction, re-use and re-cycling (“East African Breweries”, 2010). The manufacturing objective can be measured through manufacturing lead time and capacity utilization ensuring better customer response and flexibility. Improved delivery involves measures such as supply chain cycle time ensuring there is no non-value time hindering the supply chain process. Time compression ensures information and products flow smoothly and quickly (Brewer & Speh, 2000).

## **2.4 Supply Chain Performance Measurement**

In today's evolving world, Supply Chain Performance (SCP) is one of the key factors for enhancing organizational effectiveness and competitiveness, especially in the current era of global competition, customer awareness, technology advancement and outsourcing hence the need for accurate supply chain performance measurement tools (Park et al., 2005). In the midst of fundamental revolution and the nature of business, for an enterprise to thrive, it has to understand how the supply chain networks work and how to make them work better (Githinji, 2010). A key feature of present day business is the idea that it is the supply chain that competes, not the companies and the success or failure of the supply chain is largely determined in the market place by the customer (Stock, 2001).

Measuring supply chain performance can therefore facilitate a better understanding of the supply chain, positively influencing supply chain players' activities, and improving its overall performance (Chen & Paulraj, 2004). In order to achieve the supply chain goal of fulfilling customer orders more quickly and efficiently than other competitors, a supply chain needs continuous improvements (Hausman, 2002). It demands that effective performance measurements be established and thus a performance measurement tool is required.

In the early years of globalization, the power of suppliers moved from supply side to the demand side of the customers (Thakar et al., 2012). Consumers became more aware of their needs; they wanted a variety of choices making performance measurement to be geared towards customer satisfaction with measures such as flexibility, order response time and availability being considered. In the take off years of 1980s-1990s the supply chain evolved with concepts such as Just in Time systems and Total Quality Management coming into place. Technology advancements in terms of short product life cycles, shorter lead times, Enterprise Resource Planning systems and Electronic data interchange systems evolved. Companies also placed much emphasis on financial indicators for measuring performance, such as sales, productivity, net present value and return on investment (ROI). They evaluated their performance by looking at their financial scores. Nevertheless, they recognized that good financial performance in the past does not predict good performance in the future in the dynamic competitive economy (Arik, 2006). Organizations realized the need of using new performance measurement tools that described the past as well as the future performance.

“Previous executive management will judge the company’s performance by financial results as reflected on the profit and loss statement and the balance sheet. Top management in new economy companies will also examine the marketing scorecard to interpret what is happening to product quality, customer loss rate, customer satisfaction, product development, market share (not just sales revenue) relative to competitors, and other measures. They recognize that changes in marketing indicators predict changes in financial results.” (Kotler, 2003, p.38).

It became essential to have performance measures that provided a blend of the financial, customer, internal business, and learning and growth needs of an enterprise. The balance scorecard (BSC) developed by Kaplan and Norton (1992) was one of the many performance measurement tools that developed involving customers, financial, internal business and learning perspectives. Other performance measurement tools that evolved included the SCOR model that combines cycle time metrics, cost, service and asset metrics; the Logistics scoreboard that intergrates performance measures under logistics financial measures, productivity and quality logistics measures; the ABC model that assigns costs to activities rather than products or services. Performance measures in supply chain are important for management and operational level needs. Thakar et al. (2012) emphasizes that supply chain performance measurement systems play an important role in business strategy implementation.

## **2.5 Challenges In The Implementation of The Balanced Scorecard**

Even though potential benefits from implementation of the BSC are numerous, it has been suggested that many of the BSC projects either fail or do not materialize (Nyaega, 2006). According to Creeman (1998), half of the BSC implementation fail because they do not live to users expectations. The BSC gives us a snapshot of organizational health. It does not give a three dimensional picture (Nyaega, 2006). According to a KPMG report, cited by McCunn (1998), more than 70% of scorecard implementations fail. Failures may be due to a lack of highly developed information systems, inadequate top-management support or excessive management focus on short-term issues (Chan, 2004). Gautreau and Kleiner (2001) state that part of the difficulty in using the balance scorecard is trying to automate the system.



There are no specific measures for measuring supply chain performance due to different industries, sectors, strategies and contexts used. Brewer and Speh (2000) state that the challenge for managers is to craft measures that focus on key supply chain processes and interactions. An organization must identify its specific measures that relate with its goals. This poses a challenge to many managers as they have to determine measures that are relevant to their specific organization, industry, needs, products and customers served.

Graham (2003) criticized the BSC as too expansive and too inclusive to be of specific use to most firms. Measures developed for an organization should always be balanced and easy to interpret. Use of too many measures leads to loss of balance and important issues will not be addressed. Measures should be few in number, but highly relevant and focused on improvement rather than the achievement of a measure (Mbogo, 2008). According to Shaw and Grant (2010) supply chains are complex structures and as a consequence practitioners have created many measures often duplicating the same measures hence a challenge in measuring supply chain performance. The BSC has to have few and relevant measures which are difficult to achieve since there are various activities to be measured.

Gatreau and Kleiner (2001) stated that constantly updating the scorecard is burdensome and requires a lot of time and resources. The scorecard needs to be updated as organizations change and strategies are re-aligned. Newing (1994) argues that the costs of updating the scorecard may well outweigh improvements in organizational performance. This complexity might encourage organizations to attempt partial application of the system, for instance to develop senior level measures only (Mbogo, 2008). The BSC may therefore not be used as the overall goal congruency system for which it was intended .

Norreklit (2000) analyzed the cause-and-effect chain assumptions presented in the BSC model. In her view, the BSC is a flawed model, often based on false estimations of the cause-effect relationship. Her conclusion regarding this relationship is that the BSC model lacks a time-lag dimension because it measures different activities at the same point in time. According to her the various time scales of the different areas in the scorecard are not considered. Whereas the effect of some activities, such as dismissal of several part-time employees, is almost immediate, the impact of others for example, investments in research and development processes, will be recognized only later or gradually over time (Mbogo, 2008). Bhagwat and Sharma (2007) identified failure to relate key measures to performance

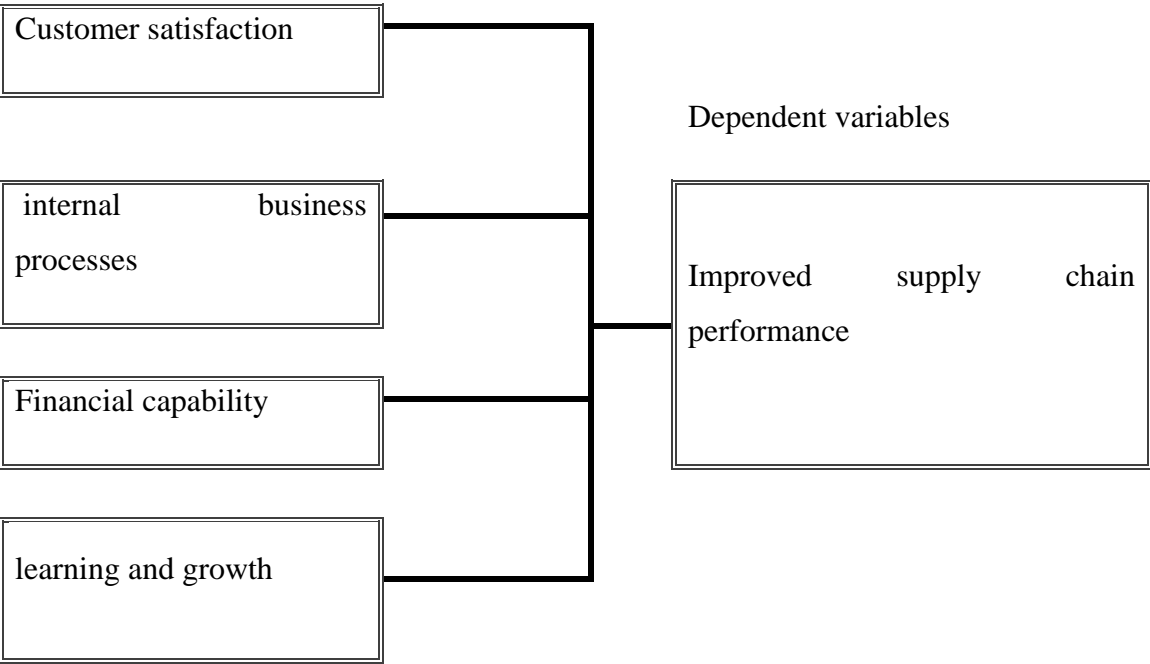
drivers by means of cause-and-effect relationships as a challenge in the BSC implementation. According to the study of the BSC in various small-medium enterprises, one of the companies identified a few cause-and-effect relationships and performance drivers. The performance drivers for internal business perspective included faultless deliveries, customer query response time, and supplier rejection rate but the management team neglected to specify how the performance in these three areas would be improved. Explicit cause-effect relationships should be identified before a balanced supply chain management scorecard is implemented (Bhagwat & Sharma, 2007).

## **2.6 Conceptual Framework**

From the above literature, it is evident that supply chain performance is influenced directly by the BSC perspectives. The financial, customer, internal business, learning and growth perspectives directly influence efficiency and effectiveness of the supply chain. Chia et al. (2009) found that the measurement of supply chain performance could be improved by using a more balanced approach as provided for by the BSC framework. The integration of the measures allows management to assess the overall competitiveness of the entire supply chain and determine internal variables that need improvement. Effective supply chain performance can be improved by having a blend of financial and non-financial measures (Gautreau & Kleiner, 2001) and the BSC framework measures up to those requirements. Therefore, applying the BSC measures can improve the supply chain performance of KNC thereby increasing the customers, financial, internal business, and learning and growth aspects of the company.

Fig 2.2 Conceptual framework

Independent variables



Source: Researcher, (2013)

## **CHAPTER THREE**

### **RESEARCH METHODOLOGY**

#### **3.1 Introduction**

The chapter describes the proposed research method. This includes the research design, target population, method of data collection and techniques for data analysis.

#### **3.2 Research Design**

This research was conducted through a case study. A case study is chosen because it will enable the researcher to have an in depth understanding of the performance of Kenya Nut Company Limited. The importance of a case study is emphasized by Young (2010) and who acknowledge that a case study is a powerful form of qualitative analysis that involves a careful and complete observation of a social unit irrespective of what type of unit under study. Mugenda (2003) proposed the use of a case study when an in-depth investigation of an individual, group, institution or phenomenon is required.

#### **3.3 Population Of Study**

A total of 40 employees which comprises of procurement, supply chain and logistics staff at KNC were used for the purpose of the case study. This is based on the assumption that these are the staff members with knowledge of the BSC supply chain measures.

#### **3.4 Data Collection**

The study relied on primary data, which was collected through structured questionnaires. The questionnaires were both closed and open-ended so as to allow the respondents to express their views without limitation. Questionnaires were dropped and picked later from the staff members in the various departments. The questionnaire was in the form of Likert scale where respondents were required to indicate their views on a scale of 1 to 5. The questionnaire contained 3 sections: section A was on general information about the respondents, section B comprised of questions involving the extent of the BSC measures on the supply chain at KNC grouped under financial, customer, internal business and learning and growth perspectives while section C covered the possible challenges faced in implementing the BSC measures(See Appendix 1)

### 3.5 Data Analysis

MS Excel and Statistical Package for Social Sciences Software (SPSS) was used to conduct statistical analysis of the data. Frequency tables and bar charts were used to compare results. The following regression analysis was used(  $Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4$ ) where ;Y was the dependent variable(supply chain performance), a =Y intercept,  $b_1$ ,  $b_2$ ,  $b_3$ ,  $b_4$ , and  $b_5$  were regression weights attached to the variables; e is the error term;  $X_1$ (customer satisfaction), $X_2$ (internal business process)  $X_3$ (financial capability) and  $X_4$ (learning and growth).

## **CHAPTER FOUR**

### **DATA PRESENTATION AND ANALYSIS**

#### **4.1 Introduction**

This chapter presents analysis, interpretations and findings of the study as set out in the research methodology. The chapter is structured according to the questions in the questionnaire and provides discussion of the findings together with their implications.

#### **4.2 Response Rate**

The data was gathered exclusively from the questionnaire as the research instrument. The questionnaire was administered on a drop and pick basis. Follow ups were done by means of telephone calls to expedite the process. Out of the target population of 40 respondents, 31 responded thus achieving a response rate of 77.5%. According to Nassiuma (2002) only a response rate above 35% is robust enough for statistical sensible analysis.

#### **4.3 Demographic Data**

Data was collected to determine respondents department, the number of years respondents have worked at KNC, gender of respondents and age of respondents.

According to table 4.1 below, 29% of the respondents work in procurement department, 39% and 32% in logistics and supply chain respectively. The majority of respondents are in the logistics department since the department has more employees in the areas of warehousing and transportation.

Table 4.1 Respondents Department

Department	Frequency	Percentage (%)
Procurement	9	29
Logistics	12	39
Supply Chain	10	32
Total	31	100

According to table 4.2 below, the number of years of experience is highest at 35% for 7-10years since the company has been in operation for a long duration of time, followed by 26%

for 4-6 years, 23% for 10 years and above and lastly 16% for 0-3years. The company has been in operation for a long time hence the high number of employees who have worked for 7-10 years.

Table 4.2: Years respondents have worked at KNC

No. of years	Frequency	Percentage (%)
0-3	5	16
4-6	8	26
7-10	11	35
10 above	7	23
Total	31	100

From the table 4.3 below, the gender distribution of respondents at KNC is 61%male and 39%female.This shows the gender equality of the respondents with a ratio of 6:4.

Table 4.3: Gender

Gender	Frequency	Percentage(%)
Male	19	61
Female	12	39
Total	31	100

According to the table 4.4 below, majority of respondents were aged between 31-45years representing 55%, followed by 26%, 19% representing 20-30 years and 45 years and above respectively.

Table 4.4 Age of respondents

Age of respondents	Frequency	Percentage(%)
20-30 years	8	26
31-45years	17	55
45 years and above	6	19
Total	31	100

#### 4.4 Extent of the BSC measures in Supply Chain Performance at KNC

The study sought to find out the extent to which the BSC measures have been implemented in the supply chain at KNC. The respondents gave their responses on a scale of 1-5 where 1 represents to a very large extent and 5 very small extent.

The study sought to establish the extent to which the various financial measures of the BSC were used. From the figure 4.1 below, 26% of respondents agree to a very large extent on using the percentage of sales growth as a measure in the supply chain followed by 25%, 23%, 16%, 10% agreeing to a moderate extent, large extent, small and very small extent respectively. 29% of respondents agreed to a small extent on measuring return on supply chain assets followed by 23% very small extent, 19% both moderate and large extent and 10% very large extent. 26% agreed to a large extent on profit margins being influential to the supply chain performance followed by 23% very large extent, 16% small extent and 10% very small extent. 32% of respondents thought the measure of cash flow management has a very small effect to the supply chain performance, 19% very large and large extent, 16% moderate extent and 13% small extent. 26% of respondents agreed to a very small extent and small extent on measuring cost per operation hour followed by 23% large extent, 13% moderate extent and 10% very large extent.

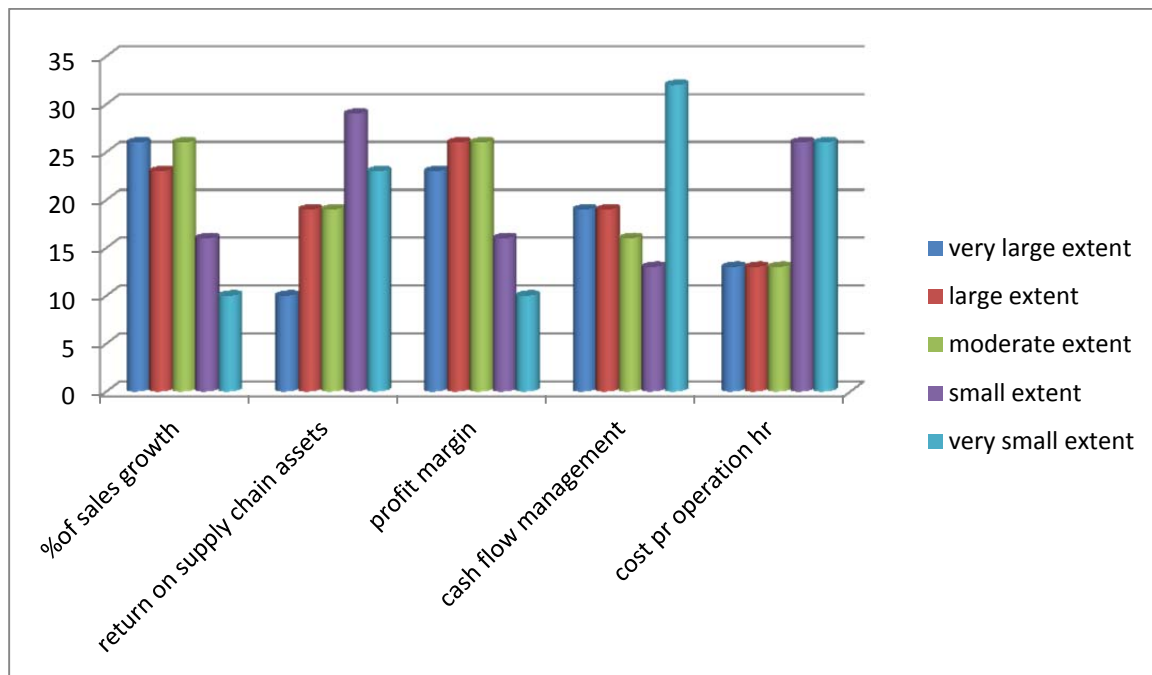


Fig.4.1 Financial measures



It is thus evident that measuring the percentage of sales growth and profit margins are measures that are extensively used in the supply chain in knowing the financial capability of the enterprise followed by cash flow management and lastly cost per operation hour and return on supply chain assets.

From figure 4.2 below, 27% of respondents agree to a very large extent that determining the range of products offered to customers is a measure applied in the organization, 19% agree to a large and moderate extent, 15% agree to a very small extent while 13% to a small extent. 26% agree to a moderate extent on the use of order lead time followed by 19% large extent, 16% large extent, 12% small extent and 10% very small extent. 23% agree to a very large extent and large extent that measuring the level of quality products offered to customers can improve performance of the supply chain, 16% agree to a moderate extent, 8% small extent and 5% very small extent. 29% of respondents agree to a very small extent on measuring the number of repeat versus new customers acquired, 19% to a small, moderate and large extent while 13% agree to a very large extent. 22% of respondents agree that measuring on time delivery can improve supply chain performance to a very large extent followed by 19% large extent, 17% small and very small extent.

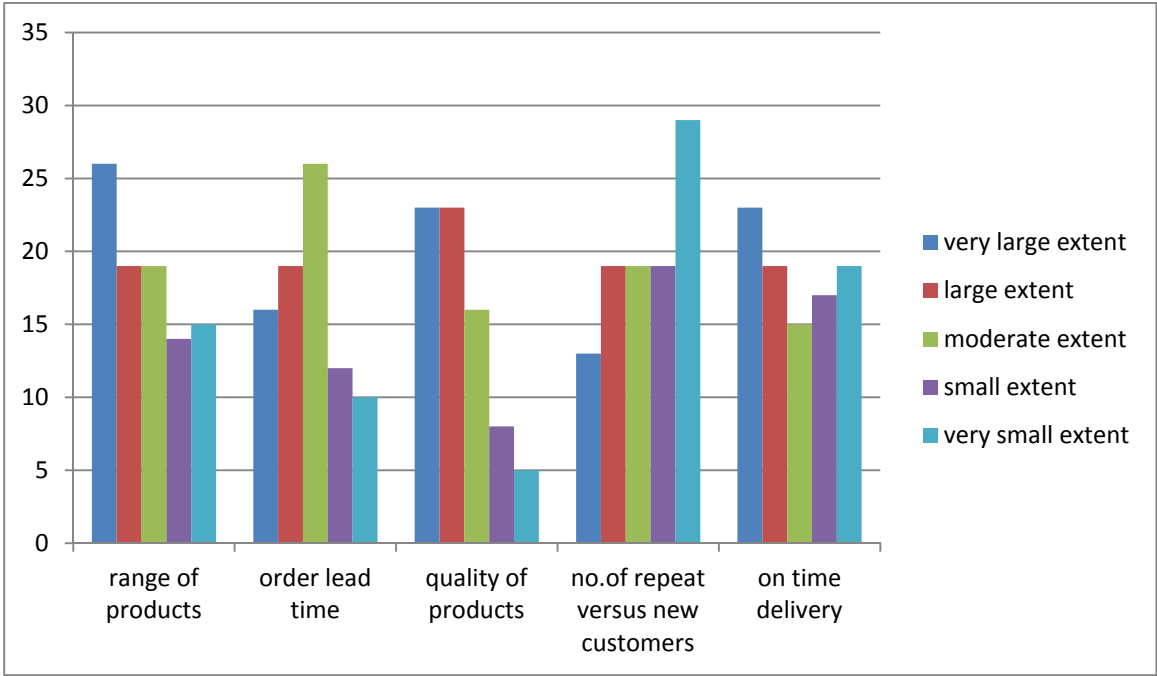


Fig 4.2 Customer measures

Measuring range of products offered , the level of quality of products provided and on-time delivery of the products to customers are significant measures in the supply chain. This is an indication that customers are a priority to the success of the company. KNC can therefore

achieve product leadership and improved customer relationship with its customers. This supports the findings of (Arik, 2006) who asserted that one of the changes in business practices dictated by the transition from the industrial age to the information age is the shift of enterprises from being production- and product-focused to being customer-focused .

From figure 4.3 below ,the researcher sought to determine internal business measures that are used at KNC. It was established that the accuracy of forecasted demand, supply chain cycle time and the level of responsiveness to urgent deliveries are used extensively in the supply chain to a very large extent of 23% ,19% and 19% respectively. Total inventory cost and capacity utilization measures are used to a very small extent of 25% and 31% respectively.

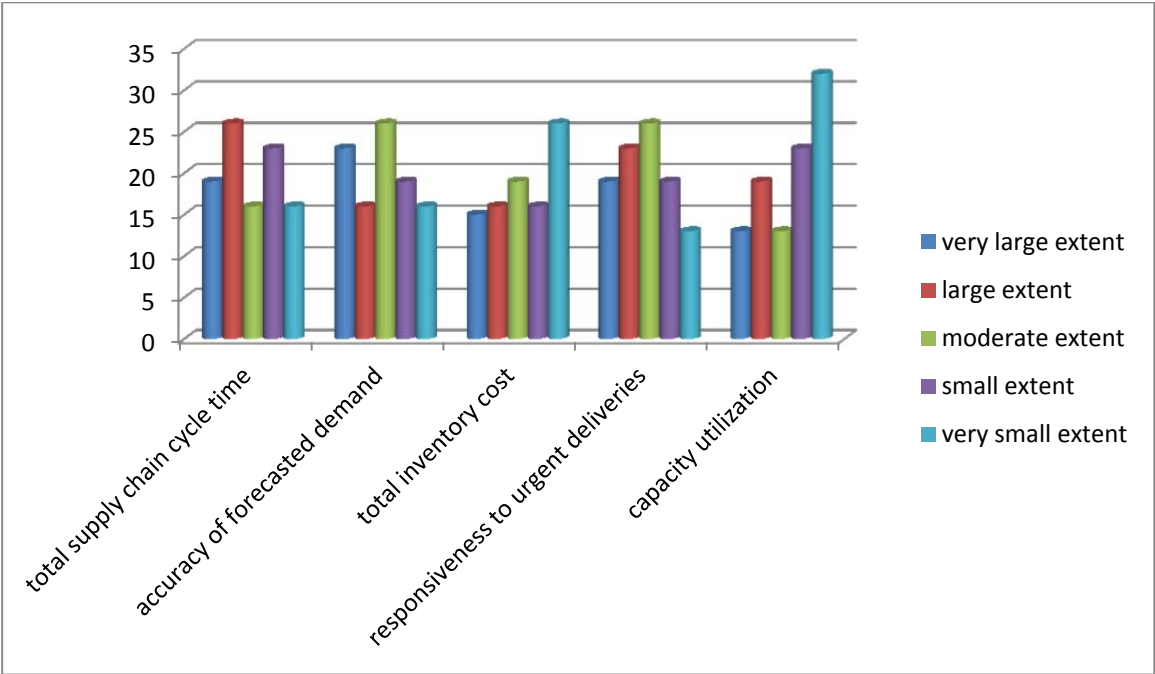


Fig.4.3. Internal business measures

Measures determining the Accuracy of forecasted demand, supply chain cycle time and responsiveness to urgent deliveries are given more attention ensuring flexibility in demand patterns of the supply chain processes.

The researcher sought the view of the respondents on the extent to which the learning and growth measures above are implemented in determining the supply chain performance. The results as shown in fig 4.4 below confirm that level of partnerships with suppliers,

information sharing with other organizations and the Kenyan government and increased involvement of employees in the supply chain are implemented to a very large extent of 27%,25% and 21% respectively.

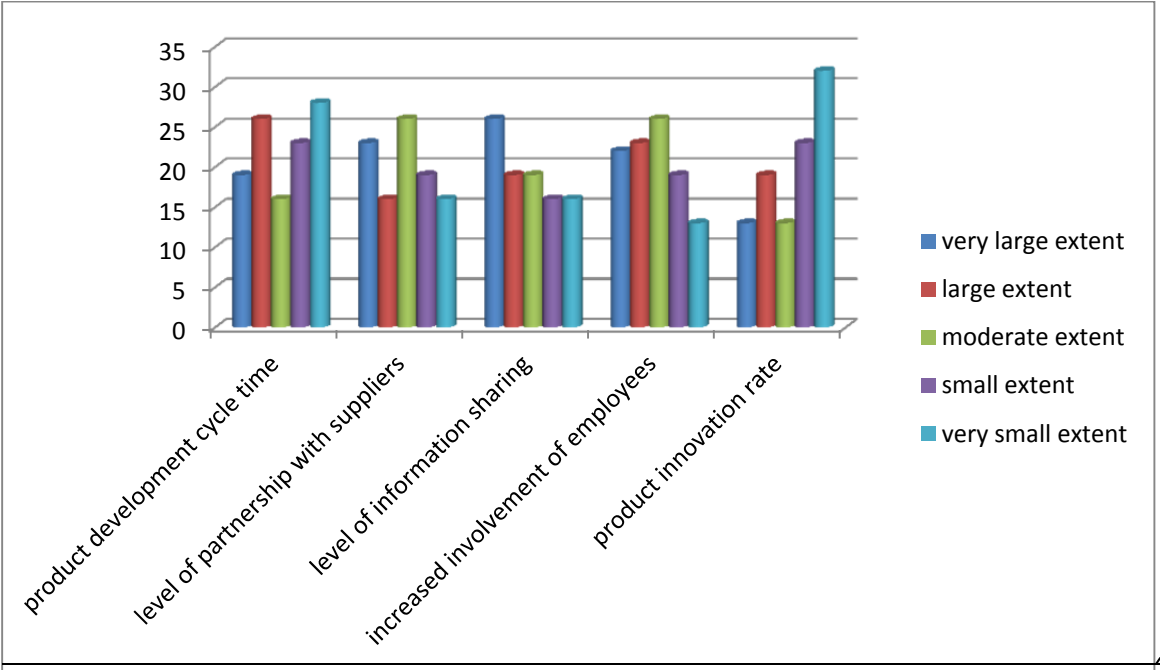


Fig 4.4 Learning and growth measures

This is an indication that KNC embraces technology advancements and good relationships with its employees and suppliers thereby providing a conducive environment for the smooth flow of operations. Product development cycle time and product innovation rate are implemented to a very small extent of 27% and 32% respectively.

The respondents were also requested to confirm the challenges faced when implementing the BSC .The findings as seen in fig 4.5 below confirm that 19% to 28% of respondents between medium to a very large extent confirm that it is a challenge to implement the BSC as it requires a lot of time to develop the measures .Too many measures in implementing the BSC and difficulty in determining which measures to use are challenges to a large extent of 28% and 22%respectively.Lack of highly developed information systems and lack of skills in developing the BSC are challenges that affect the respondents to a very small extent of 26% and 22% respectively.

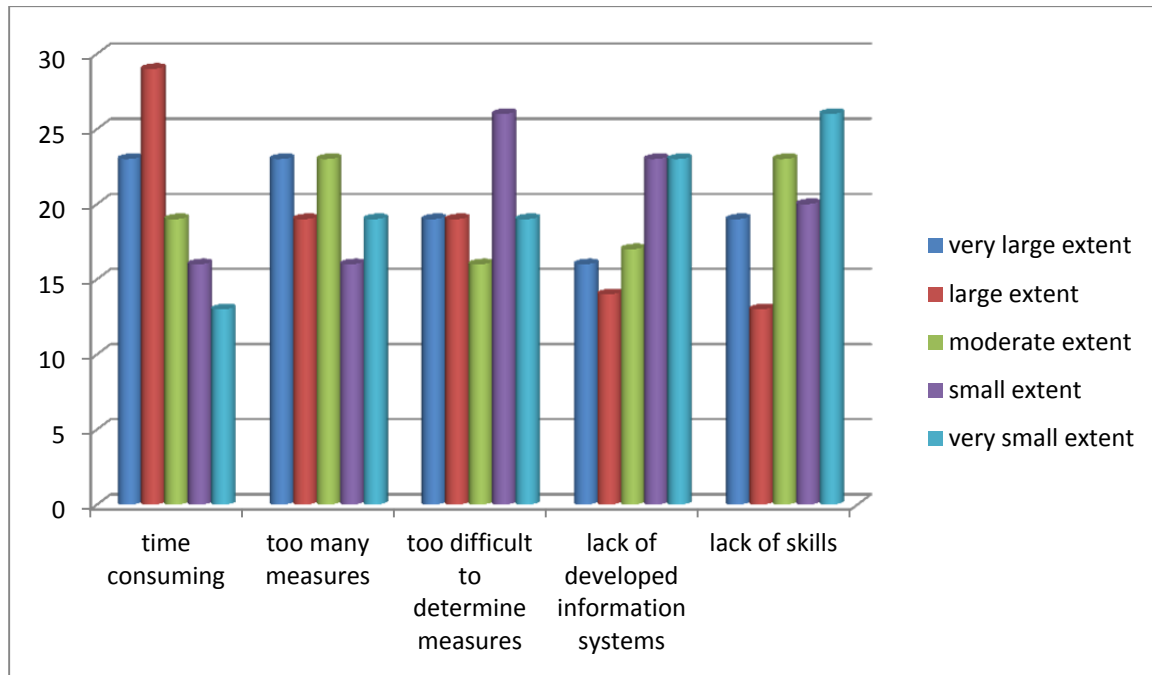


Fig.4.5 Challenges in the implementation of the BSC

#### 4.5: Relationship between the Balanced Scorecard measures and Supply chain performance

The study also sought to determine the relationship that exists between the balanced scorecard measures at KNC and the performance of its supply chains. The researcher conducted a regression analysis to assist explain this relationship

The study adopted the following linear regression model to depict the expected relationship as seen in the table 4.5 below .The regression equation  $Y = a + b_1X_1 + b_2X_2+b_3X_3+b_4X_4$ ) becomes  $Y=2.869+0.541X_1+0.148X_2+0.122X_3+0.292X_4$  where Y is the dependent variable (Supply chain performance),  $X_1$  is customer satisfaction,  $X_2$  is financial strength,  $X_3$  is internal business and  $X_4$  is learning and growth .

The data findings analyzed also show that taking all other independent variables at zero, a unit increase in customer satisfaction leads to a 0.541 improvement in supply chain performance of the companies supply chain. A unit increase in financial strength will lead to a 0.148 increase in supply chain performance, a unit increase in internal business processes will lead to a 0.122 improvement in supply chain performance while a unit increase in learning and growth leads to a 0.169 improvement in the supply chain performance. It is therefore evident that the BSC measures affect the supply chain performance at KNC. The study also

established  $r=0.845$  therefore  $r^2 =0.73$ . There is a 73% variation in supply chain performance caused by the BSC measures (financial, customer, internal business and learning and growth). The use of the BSC contributes to the supply chain performance at KNC. Therefore, the BSC measures are essential in enhancing the performance of the supply chain given that the unexplained variance is only 27% .

Table 4.5 Test of Coefficients

	Unstandardized coefficients		Standardized coefficients	t	Sig
	B	Std. Error	Beta	B	Std Error
SCP	2.869	1.279		2.243	.040
Customer satisfaction	.541	.577	.255	.938	.363
Financial strength	.148	.621	.489	1.848	.084
Internal business	.122	.520	.061	.235	.817
Learning and growth	.292	.235	.337	1.245	.232

## **CHAPTER FIVE**

### **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

#### **5.1 Introduction**

This chapter presents the summary of the findings from chapter four, and it also gives the discussions, conclusions and recommendations of the study based on the objectives of the study. The objectives of this study were to establish the extent to which the BSC is used on the supply chain performance and to determine the challenges faced in the implementation of the BSC at KNC.

#### **5.2 Summary of Findings**

The study established that most employees have worked at KNC for more than 7 years therefore they have more insights on the use of the BSC in the organization. This shows that the company has used the BSC measures for a long time.

The study confirmed that KNC has implemented measures such as percentage of sales growth and profit margins. This has enabled KNC to ensure financial success of the company through improved profits and revenue.

It was evident from the study that offering a range of products to customers such as honey coated and cheese coated macadamia nuts can be used to determine the supply chain performance. This ensures product leadership and effective customer relationship of the macadamia nuts in the market is achieved as compared to the competitors. This confirms the argument by Brewer & Speh (2000) who assert that the different demands, desires and idiosyncrasies of customers all along the supply chain must be understood and managed effectively. It was also established that ensuring on time delivery of products and offering high quality products is a priority at KNC. This enables good customer relationship between the company and the consumers.

The study established that measuring the supply chain cycle time enabled efficiency in the supply chain. This implies that delivery of products from the factory to the respective stores and supermarkets is done in a timely manner. Responsiveness to urgent deliveries and accuracy to forecasted demand is a primary tool to flexibility in the supply chain. This is supported by East African Breweries Limited (EABL) who have excelled in inventory

management by having demand solutions that are flexible to meet the complex supply chain needs enabling reduction, re-use and re-cycling (“East African Breweries”, 2010).

It was also established that KNC has had partnerships with suppliers ensuring good relationships and co-operation with the suppliers. This shows that objectives of Information capital and human capital are achieved at KNC. Information is also shared between the company, government and other associations such as Nut Processors Association of Kenya enabling accurate and timely information exchange. This is supported by Li and Zhang (2006) who state that information sharing is being embraced in organizations through exploring advancements in technology such as use of the internet, intranet, databases, Electronic Data Interchange (EDI), Enterprise Resource Planning (ERP) and Distribution Requirements Planning (DRP) systems to exchange data, information and knowledge along the supply chain and in collaboration with its partners and the government.

The findings of the study revealed that even though the BSC measures have been used extensively in the organization, various challenges have been faced in its implementation. From the study, it was established that the BSC measures are too many since each perspective has to have its own measures making the process cumbersome. This confirms Graham (2003) who criticized the BSC as too expansive and too inclusive to be of specific use to most firms. Most respondents thought that developing and updating the BSC was too time consuming hence a challenge. This can be attributed to the fact that when organizational structures are re-aligned and strategies are continuously changing the BSC measures also require development and updating. Gatreau and Kleiner (2001) stated that constantly updating the scorecard is burdensome and requires a lot of time and resources. Determining which measures to use is also a challenge. Some measures can be contradicting to each other making it difficult to know which to use. Lack of highly developed systems and lack of skills in developing the BSC were the least challenges faced by the respondents. This shows that the staff at KNC has not invested highly in information technology with the internet, intranet, and Enterprise resource planning systems among others.

### **5.3 Conclusions**

The study concludes that KNC has embraced some of the BSC measures in its supply chain. The study established that measures of range of products, timely delivery of products, responsiveness to urgent deliveries, profit margins, percentage of sales growth, accuracy of forecasted demand, supply chain cycle time, level of partnerships with suppliers, information

sharing and involvement of employees are the main measures that are used in establishing performance of the supply chain. This shows that the objectives of product leadership, improved customer relationship, increased profit, increased revenue, improved flexibility, delivery, information and human capital are achieved. However, KNC have not yet embraced some critical BSC measures that are relevant to an improvement in their supply chain as discussed below. The major challenges faced in the implementation of the BSC at KNC include too many measures being used, time consuming in developing the measures and difficulty in determining measures.

#### **5.4 Recommendations**

The study has confirmed that the BSC measures are significant in enhancing supply chain performance at KNC. Other organizations should therefore embrace the BSC measures in their supply chain operations. KNC should also embrace measures such as return on supply chain assets and cost per operation hour so as to know total capital invested in the supply chain assets such as logistical equipment and the return in terms of cash from the customers. The measure of order lead time should be implemented since it measures the time it takes to respond to customers orders ensuring efficiency in the supply chain. A reduction in the order lead time leads to a reduction in the customer response time hence an efficient supply chain (Gunasekaran et al., 2001).

KNC should also put more emphasis on product development cycle time since with the technology advancements and changing customer tastes and preferences there is need for continuous product innovations and improvement. It is evident that the BSC measures enhance efficiency and effectiveness in the supply chain in terms of financial strength, customer satisfaction, internal business process and learning and growth. The challenges that KNC faces are a means towards continuous improvement. If the challenges are monitored and used as benchmarks, implementing the BSC and overcoming the challenges will enable KNC to fully adopt the BSC in its supply chain.

#### **5.5 Limitations of the Study**

The findings of this study were limited to KNC only. The findings do not give a representative of other organizations producing macadamia nuts. It was also difficult for the researcher to convince the respondents to participate in the study due to factors such as time and confidentiality of information being given. Most of the respondents agreed to participate



on condition that the information will not be divulged to any other party other than for academic purposes only

## **5.6 Suggestions for Further Research**

A comparative study can be carried out to establish the BSC measures that enhance supply chain performance in other companies in Kenya .The survey method of data collection can be used .This will enable a comparison of the BSC between various companies and provide findings on which conclusions can be made.

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## APPENDIX: QUESTIONNAIRE

### PART A: GENERAL INFORMATION

(Please tick where appropriate)

1. Name of department .....

2. How many years have you worked at Kenya Nut Company?

0-3years [ ]

4-6years [ ]

7-10years [ ]

10years and above [ ]

3. Gender

Male [ ]

Female [ ]

4. Age of respondent

20-30years [ ]

31-45years [ ]

Above 45 years [ ]

**PART B: THE EXTENT OF THE BSC ON SUPPLY CHAIN PERFORMANCE (Please tick where appropriate)**

1) To what extent does your company use the following financial measures in determining its supply chain performance ?

1= Very large extent 2= Large extent 3= Moderate extent 4= Small extent 5=Very small extent

	Measures	1	2	3	4	5
1	Percentage of sales growth					
2	Return on supply chain assets					
3	Profit margins					
4	Cash flow management					
5	Cost per operation hour					

If others (please specify)

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2)To what extent does your company use the following customer measures in determining supply chain performance?

1= Very large extent 2= Large extent 3= Moderate extent 4= Small extent 5=Very small extent

	Measures	1	2	3	4	5
1	Range of products offered to customers					
2	Order lead time					

3	Quality of delivered products					
4	The number of repeat versus new customer orders					
5	On-time delivery of products					

Others (please specify)

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4) To what extent does your company use the following internal business process measures in determining its supply chain performance?

1= Very large extent 2= Large extent 3= Moderate extent 4= Small extent 5=Very small extent

	Measures	1	2	3	4	5
1	Total supply chain cycle time					
2	Accuracy of forecasted demand					
3	Total inventory cost					
4	Responsiveness to urgent deliveries					
5	Capacity utilization					

Others(please specify)

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5) To what extent does your company use the following learning and growth measures in determining its supply chain performance?

1= Very large extent 2= Large extent 3= Moderate extent 4= Small extent 5=Very small extent

	Measures	1	2	3	4	5
1	Product development cycle time					
2	Level of partnerships with suppliers					
3	Level of information sharing					
4	Increased involvement of employees					
5	Product innovation rate					

**PART C: CHALLENGES IN THE IMPLEMENTATION OF THE BSC (Please tick where appropriate)**

Respond to the following statements on challenges facing your organization in the implementation of the BSC

1= Very large extent 2= Large extent 3= Moderate extent 4= Small extent 5=Very small extent

	Challenges	1	2	3	4	5
1	Time consuming in developing and updating BSC					
2	Too many measures to be used					
3	Too difficult in determining measures					
4	Lack of highly developed information systems					
5	Lack of skills and know how in developing BSC					

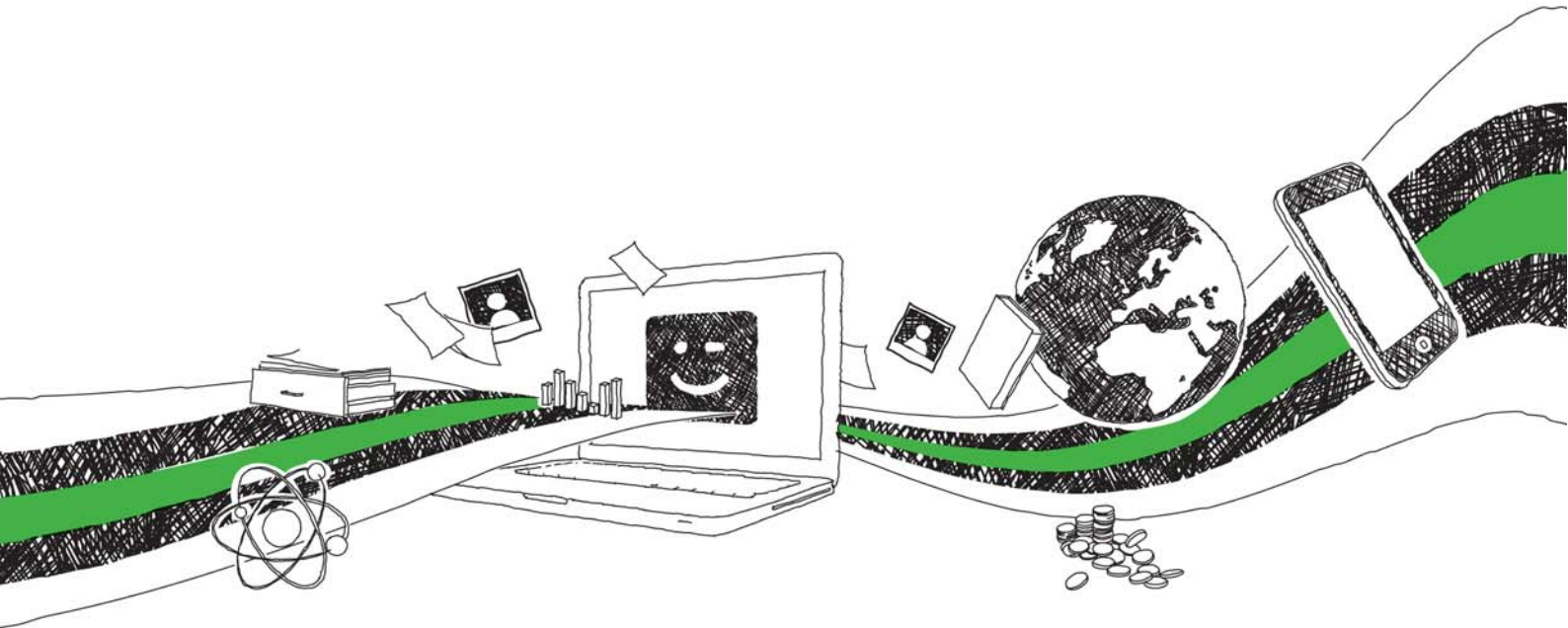
Others (please specify)

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