

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE



DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

EXAMINING SUPPLY CHAIN PERFORMANCE OF SELECTED BREWERIES IN ETHIOPIA
USING SCOR MODEL
(The case of BGI and Habesha Brewery S.C)

BY

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A THESIS SUBMITTED TO THE SCHOOL OF GRADUATE STUDIES OF ADDIS ABABA
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Statement of Certification

This is to certify that **Yaregal Lakew Animute** has carried out his research work on the topic entitled, “**Examining supply chain performance of selected breweries in Ethiopia using SCOR model: the case of BGI Ethiopia and Habesha Brewery S.C**” is his original work and is suitable for submission for the award of Master of Arts Degree in Logistics and Supply Chain Management.

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Declaration

I the undersigned, declare that the thesis entitled “**Examining supply chain performance of selected breweries in Ethiopia using SCOR model: the case of BGI Ethiopia and Habesha Brewery S.C**” is my original work and has not been presented for any other University for any other requirements, and that all sources of materials used for the thesis have been properly acknowledged.

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Date: _____

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Definition of Terms

BGI - des Brassieres et Glaciers Internationale

SCOR- Supply Chain Operations Reference

SCC- Supply Chain Council

SCM- Supply Chain Management

SCP- Supply Chain Performance

SPSS- Statistical Package for Social Science

Abstract

The objective of the research study is to examine the supply chain performance of selected breweries in Ethiopia, the case of BGI and Habesha Brewery S.C. The researcher has used SCOR model to measure the performance of the supply chain of the case breweries. The study is descriptive research. The researcher undertakes a census study in case breweries and purposive sampling in suppliers and distributors. The study has used primary data collected through self-administered questionnaire and semi-structured interview questions. The self administered questionnaire data are analyzed using mode as a measure of central tendency. The semi-structured interview data are also organized and presented. The two case breweries data are analyzed separately. According to the findings of the study, both breweries are best performers in the reliability and poor performers in supply chain cost performance attributes. Company A is an advanced performer in Responsiveness while company B is best performer in this performance attribute. On the other hand, Company A is best performer in supply chain asset management and company B is advanced performer in this performance attribute. In agility performance attribute, company A is poor performer while company B is advanced performer. The researcher recommends the supply chain of the case breweries to give much attention on which they are poor performers and also to advanced performance attributes in order to get the competitive advantage over their competitors. All in all, the case breweries shall measure their supply chain performance periodically in order to take corrective action to their strategy.

Key Words: supply chain performance, SCOR model, performance metrics, breweries

CHAPTER ONE

Introduction

1.1 Background of the Study

Beamon (1980) defined supply chain as an integrated process in which suppliers, manufacturers, distributors and retailers work together to bring a product to their customers with a forward flow of materials and backward flow of information. The author explained the difference between traditional and recent definition of supply chain management, where the recent one includes the reverse logistics. According to Silvio and Carlos (2001), Supply chain can be represented as a group of integrated logistical process that originates at the raw material source until delivering the product to customers while sharing a common goal along the supply chain.

The concern of supply chain becomes high. The reasons are the rising cost of manufacturing, the decreasing of resources manufacturing bases, shortened product life cycles, the leveling of playing field with in manufacturing and the globalization of market economies (Beamon, 1998). Gunasekaran et al. also added the reduced barriers to international trade, improvements in information availability and environmental concerns are among the reasons (Gunasekaran et al., 2004). The increasing global market competition in manufacturing firms has forced companies to look for efficiency in their Supply chain (Irfan et al., 2007).

According to Lambert and Cooper (2000) and Silvio and Carlos (2001), the modern competition has shifted from individual firms into their supply chain. Irfan et al, (2007) and Charkha and Jaju (2015), also added supply chain is considered as a source of competitive advantage for companies working in the world. The success and failure of manufacturing firms bases on their ability to change and make reliable themselves to the market. For manufacturing firms to bring their product competitive in the market in terms of cost, time, quality and delivery of the product (Saxsena and Teewari, 2012), companies are forced to look to their supply chain in creating new standards to improve business processes. This standard is the supply chain performance measurement which could assist manufacturing firms to view their performance in an integrated way throughout their supply chain.

According to Guansekara and Kobu (2007), performance measurement in the supply chain has a lot of advantages. Through measuring the performance of the supply chain, firms can identify

their success, check if customer needs are met, better understand the processes, identify the bottlenecks in their Supply chain, enable managers to make an informed decision, enabling and tracking progress and facilitating an open and transparent communication and cooperation in the supply chain.

According to Sukati et al., (2005) the aim of supply chain is improving profitability, delivering value to customer, and improve interactions and interdependence among firms. Delivering the right product, at the right price, at the right time to its customers is not only improving competitiveness in the market but also it is the question of survival in the market. Selecting the right performance measure is critical for the success and competitiveness of the firm in the globalization world (cited Birhanu et . al., 2018). Gunasekaran et al., (2004), considered SCM as a major component of competitive strategy to enhance organizational productivity and profitability.

In order to get the sweet fruits of the supply chain, Sillanpaa and Kess (2012 and 2011), the supply chain has to be made streamlined, lead times has to be decreased, excess process needs to be eliminated and new ways of accomplishing the processes of the supply chain need to be developed and maintained.

According to Agami et. al., (2012), there are two classes of SCM Performance systems: financial and non-financial. Activity based costing and Economic value added are among the popular measures of financial performance management system, and they considered as traditional performance measurement systems since the system focus on financial indicators and they do lack strategic non-financial measures. Agami et. al., (2012) classified non-financial measures of SCP systems into nine categories with their suffering limitation, namely function based system, Dimension based systems, Hierarchical Based systems, Interface Based systems, Perspective based systems, Efficiency Based systems, Supply Chain Operations Reference (SCOR) model, Supply chain Balanced Scorecard and Generic Systems.

SCOR model was developed and endorsed by the Supply Chain Council (SCC). It is a non-profit organization formed in 1996. The model is used as performance measurement systems for organizations as a cross industry standard for supply chain management. SCC has formulated the SCOR reference model for evaluating and comparing the supply chain activities and

performance of firms. SCOR model provides a framework that links business process, metrics, best practices, and technology in to a unified structure to support communication among supply chain partners to improve the effectiveness of supply chain performance (SCC, 2012). It integrates Business Process Re-engineering (BPR), bench marking and best practices into a cross functional frame work called process reference model. The scope of the SCOR model is from supplier's supplier to customer's customer. It measures the performance of the supply chain in a holistic approach.

According to SCC (2012), SCOR model has broad scope and definition that can be adapted to the specific supply chain requirements of any industry. Construction projects (Wibowo and Sholeh, 2015), footwear industry (Sellito et al., 2015), tobacco company (Ifiran et al., 2008), Military Service (Bean et al., 2009), Sugarcane industry (Asrol et al., 2017), brewery industry (Sintayehu, 2016) and others used SCOR model to measure the supply chain performance of a companies.

Brewery companies use SCOR model to measure their performance in order to pursue the benefits of identifying priorities for improvements and bringing strategic structure to their planning process (SLG, 2014). According to SLG report (2014), many breweries Companies have been able to successfully increase their efficiency, reduce cost and improve service level using SCOR model in their Supply chain performance.

Beer brewing in Ethiopia is dated back in 1920s (Zavatta and Samuel, 2009) when the state owned brewery factory St. George currently called 'Societe des Brassieres et Glaciers Internationale' (BGI) established. Following St. George brewery, Meta Abo brewery in 1963, Harar brewery in 1984, Bedele brewery in 1988, and Dashen brewery in 1995 have joined the beer market. Recently, Habesha Brewery SC in 2014, Raya Brewery SC in 2015 and Zebidar Brewery SC in 2016 have joined the beer market in Ethiopia. The beer market in Ethiopia attracts international brewing companies Heineken, Unibra, Bavarian, Diageo and Duet. They have either bought existing brewing companies from the government or build their own in the increasing beer market of Ethiopia.

According to Kirin Beer University Report (2016), the global beer consumption has declined by 0.6 % relatively to the previous year. But, in Africa consumption of beer grew for six

consecutive years, with an annual increase of 2.6% in 2016 which is caused by factors of rising population, urbanization and GDP growth. According to access capital report in 2008/ 2009, Ethiopia's brewery annual production and sales capacity was 3.6 and 3.05million hectoliters respectively. The annual beer consumption from 2004 to 2009 has showed an increment of 24 % per year (access capital report, 2008/9).

According to UN report (2005), adult's per capita consumption of beer in Ethiopia has reached about 4.99 liters per annum. According to reporter News Paper (2016), the total beer consumption in Ethiopia has reached at 12 million hectoliter and the per capita consumption is estimated to be around 9 liters per annum. Still, Ethiopian beer market is untapped and breweries are competing to exploit it.

Ethiopia's beer market is free for new entrants. This shows that the beer market competition will be stiffer. So that, the brewery companies are forced to focus on a timely delivery of customer orders, need to minimize supply chain cost, efficient at supply chain asset management so as to get better market share and make profit over their competitors. To get these advantages, breweries are highly pressured to measure their supply chain performance. In addition, a brewing company which measures its supply chain performance can get the access of a competitive advantage over its competitors.

The research study will examine the supply chain performance of selected breweries in Ethiopia. The case breweries are BGI Ethiopia (Addis Ababa Plant) and Habesha Brewery SC (Debre Berehan Plant). The common suppliers and distributors of respective breweries are also considered in the research study. The research data will be supported with primary data types collected through questionnaire and semi-structured interview from employees engaged in supply chain practices. The quantitative data collected using questionnaire is analyzed using descriptive statistics and presented with tables. The qualitative data collected in semi-structured interview is discussed and presented.

Finally, the research study draw conclusion and recommendation for supply chain actors to fill gaps in the supply chain which are found in research findings. Breweries could able to know their competitive advantage in their supply chain.

1.2 Statement of the Problem

Literatures related to supply chain management strongly suggests that business firms have to integrate their supply chain from supplier's supplier to customer's customer. This integration could perfectly assist the whole supply chain to perform well (Lambert and Cooper, 2000). Integration with its suppliers and customers can reduce costs, avail products timely, responsive to market changes and can create trust to its customers and suppliers (Sukati et al., and Mentzer et al., 2001). Organizations which are excellent at the management of their supply chain could get the advantage of competitive strategy (Gunasekaran, et al., 2004). The competitive strategy can enhance organizational productivity and profitability (Gunasekaran, et al., 2004). This in turn enables the company to be competitive as well as lead in the market.

The concept of supply chain in Ethiopia is a recent phenomenon except for few multi national and international companies (Sintayehu, 2016). Even though there are researches undertaken on supply chain performance, still there exists literature gap specifically in brewery industries of Ethiopia. The researcher has searched a published journal articles related with the performance of supply chain in brewery industries. The researcher found few research studies in which its title focused on the supply chain performance of the brewery. In addition, there is no research study prepared by brewery industries in the title of the study. The researcher thought that academia and the breweries didn't give much attention in measuring the supply chain performance of breweries which could enable them to gain a competitive advantage in the industry.

The research study focused on examining the supply chain performance of the case breweries based on SCOR model measuring with the five variables of reliability, responsiveness, agility, cost and asset management. The research study explicitly shows the supply chain performance of the case breweries in terms of these five variables of SCOR model.

In general, the research study adds its contribution in filling the literature gap in the supply chain performance of breweries in Ethiopia, using the SCOR model. The supply chain of the breweries can easily get the access of their performance in the study. The supply chain can take improvement actions on poor and advanced performance attributes of its chain. Then, they can easily get the access of better market share, can be responsive to their customers, make profit and finally could succeed in their business.

1.3 Research Question

The research study has undertaken aiming to answer the following questions:

- ✚ To what extent are breweries supply chains reliable to their distributors?
- ✚ To what extent are brewery supply chains responsive to the market demand?
- ✚ To what extent are brewery supply chains flexible and adaptable to market changes?
- ✚ To what extent are the case breweries managing their supply chain cost?
- ✚ To what extent are the case breweries efficiently utilizing the supply chain assets?

Following these questions, the research study reached at conclusion on performance of supply chain for the case brewery companies in Ethiopia.

1.4 Research Objectives

The research has both general and specific objectives to achieve in the entire research process.

1.4.1 General Objective

The general objective of the research study is to examine and present the current supply chain performance of the case brewery companies in Ethiopia with the application of SCOR model and indicate performance gap in the supply chain.

1.4.2 Specific Objectives

The specific objective of the study is examining the five variables of the SCOR model in case breweries of Ethiopia as follows:

- To assess the reliability of the supply chain of case brewery companies to their distributors.
- To assess the responsiveness of the supply chain of case brewery companies to the market demand.
- To measure the flexibility and adaptability of the supply chain of case brewery companies to market changes.
- To assess the supply chain cost of the case brewery companies.
- To assess the supply chain asset utilization of the case breweries.

1.5 Significance of the Study

The study gives a comprehensive summary of supply chain performance level for case brewery companies. The study could be considered as an addition to the literature gap specifically in brewery companies of Ethiopia particularly with the SCOR model application. In addition, the case brewery companies can get access of their supply chain performance gaps. From this, breweries could take a corrective action for improvements in the future. Finally, the research study recommends practitioners for further research area related with brewery companies.

1.6 The Scope of the Study

The geographic scope of the study is limited in Ethiopia. The research study is undertaken in two case brewery companies, which operates in Ethiopia. The case breweries are BGI and Habesha brewery S.C. BGI Ethiopia and Habesha brewery S.C found in Addis Ababa and Debre Berehan, respectively. The supply chain performance of the case breweries will be examined using SCOR model with the five variables of reliability, responsiveness, agility, supply chain cost and supply chain asset management. Variables other than the five variables of the SCOR model are not considered in the research study.

1.7 Organization of the Study

The research study is organized in five chapters. Chapter one contains an introduction to the research study. Chapter two contains the literature review of the study. The research methodology which guides the research study presented in chapter three. In chapter four, the collected data from breweries, suppliers and distributors are analyzed and findings are presented. The last chapter contains the summary, conclusion and recommendations of the research study.

CHAPTER TWO

Related Literature Review

2.1 Definition of Supply chain Management

The term supply chain has become popular in the past ten years (Cooper et al., 1997). However supply chain management is popular, still there exists confusion on its definition in academia, consultants and practice (Lambert and Cooper, 2000). Different scholars and institutions defined supply chain management at different times (Stock and Boyer, 2015 and Mentzer et al., 2001). Beamon (1980) defined supply chain as an integrated process in which suppliers, manufacturers, distributors and retailers work together to bring a product to their customers with a forward flow of materials and backward flow of information. She explained the difference between traditional and recent definition of supply chain management, where the recent one includes the reverse logistics.

According to Mentzer et al. (2001), they studied the existing definitions of supply chain management which have been given by academia and practice to develop a single and encompassing definition. After their study they draw the definition as follows: “Supply chain management is defined as a systematic, strategic coordination of the traditional business functions and the tactics across these business functions within a particular company and across businesses within the supply chain, for the purposes of improving the long-term performance of the individual companies and the supply chain as a whole” (Mentzer et al., 2001).

Mentzer et al. (2001) have developed a conceptual model of supply chain management (figure 2.1). In this model, they considered supply chain as a pipeline. The model incorporates directional supply chain flows, traditional business functions which manage and accomplish these flows from supplier’s supplier to the customer’s customer, and customer’s value and satisfaction, inter-functional and inter-corporate coordination.

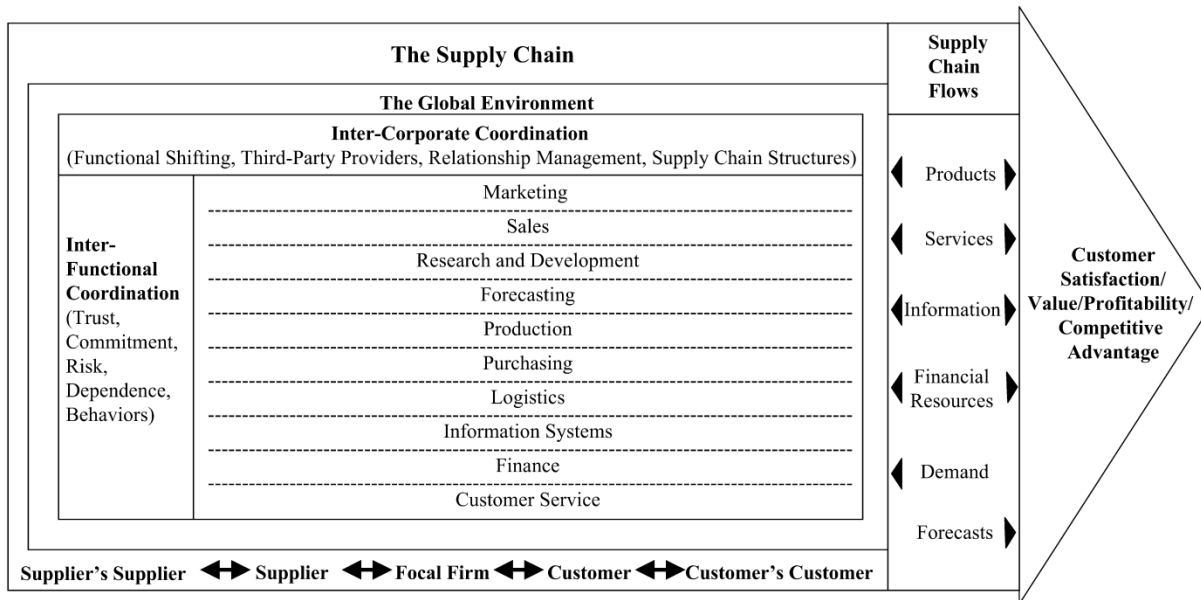


Figure 2.1 Supply Chain Management model (Source: Mentzer et al., 2001).

According to Silvio and Carlos (2001), Supply chain can be represented as a group of integrated logistical process that originates at the raw material sources until delivering the product to customer sharing a common goal along the Supply Chain. Cooper and Lambert (1997) have given emphasis on the importance of integration through the supply chain management. The international center for competitive excellence in (1994) has defined as: “Supply chain management is the integration of business processes from end user through original suppliers that provides products, services, and information that add value to customers” (cited in Cooper and Lambert, 1997).

In Stock and Boyer (2015) study, they have found many definitions of supply chain management in journals and books. They took 73 unique definitions of supply chain in the literature aiming to create a consensus definition of Supply chain management. From their study, they found three themes and six sub-themes for their consensus definition of supply chain management. These themes are activities, benefits and components. The sub-themes are also material, service, finance and information flows, network of relationships, value creation, creates efficiencies, customer satisfaction and constituents or component parts.

Stock and Boyer (2015), finally derived a consensus definition from their study as follows: “SCM is the management of a network of relationships within a firm and between interdependent organizations and business units consisting of material suppliers, purchasing, production facilities, logistics, marketing, and related systems that facilitate the forward and reverse flow of materials, services, finances and information from the original producer to final customer with the benefits of adding value, maximizing profitability through efficiencies, and achieving customer satisfaction”.

The Global Supply Chain Forum (GSCF) has defined SCM as: “the integration of key business processes from end user through original suppliers that provides products, services, and information that add value for customers and other stakeholders” (cited in Lambert and Cooper, 2000). Lambert and Cooper (2000) have defined SCM as “a network of businesses and relationships that gives the chance to capture the synergy of intra- and intercompany integration and management”. This aids the company to have a business process excellence and represents a new ways of managing the business and relationships with other members of the supply chain (Lambert and Cooper, 2000).

2.2 History of Supply Chain Performance Measurement

According to Neely et al. (2002), the history of performance measurement system has dated back to thirteenth century when the Venetian monks invented the double entry bookkeeping system using accounting performance measurement. On the other hand, Gomes et al. (2001) have divided the performance measurement phase into two. The first phase was started in the late 1880s which is characterized by cost accounting orientation. It has been used financial measures of profit and return on investment, which aims to evaluate and control the operating costs of the organization.

According to Gomes et al. (2004), the second phase has emerged following the growth of global business. In the mid of 1980s, the global business activities has showed growth and companies get a way to make business in international market (Neely et al., 2002, Mentzer et al., 2001 and Gomes et al. (2004). Due to the growth of global business, companies extend their hands to their suppliers and customers which are found worldwide. Due to this reason, accounting performance measurement lacks to measure the performance of the companies since it has built on finance, internal, backward looking and local departments than overall business performance. Accounting

performance measures faced criticism for its inappropriate measures (Gomes et al., 2004 and Neely et al., 2002).

In addition to inappropriate measures, financial measurement systems have encountered short-termism (Neely et al., 2002). They only support short term decision making. Due to these problems, managers searched a new form of performance measurement for their business. The emphasis was on the development of balanced financial and non-financial measures to suit with business strategy. The effort has enabled for the birth of non financial performance measurement systems. The non financial performance measures capture the breadth organization's objective with a balanced measurement system (Neely et al., 2002).

2.3 Performance Measurement System

Performance measurement is an important element of the planning, control and decision making (Sirsath and Dalu, 2015). According to Irfan et al., (2007) and Saxsena and Teewari (2012), the influence of competition in global economy has forced the companies to see for efficient and effective supply chain. The ability of the supply chain to cope with market changes quickly and reliably leads either for the success or failure of the business organization (Irfan et al., 2007).

Performance measurement assist decision makers providing information about the weak links, to look for operational improvements and potential opportunities, and finally it could enable the supply chain perform well (Saxsena and Teewari, 2012). Implementing appropriate supply chain management provides companies an opportunity for growth by promoting flexibility and responsiveness, effectiveness which comes from collaboration, makes agile and certain, enable companies competitive in the market (Irfan et al., 2007). A supply chain management companies could found themselves in stable and relatively predictable environment (Irfan et al., 2007).

To gain these benefits from measuring the performance of the supply chain, organizations need to assess their operations and seek for improvements (Saxsena and Teewari, 2012). According to Gunasekaran et al. (2004), to meet the objectives of the supply chain, the results gained from the processes must be measured and compared with a predefined set of standards. After measuring the actual output against the planned performance, the company can take corrective actions to reach where it has planned to be (Gunasekara et al., 2004). According to Saxsena and Teewari (2012), while companies need for improvements, they forced to look for benchmarking and best

practice in the world companies. Gunasekaran et al. (2004) have concluded that “well-defined and controlled processes are essential to better supply chain management”. In order to achieve success, companies plan and set goals to score best in their supply chain. Gunasekaran et al. (2004)

Delivering defect free products to customers faster and more reliably than no longer considered as a competitive advantage (Mentzer et al., 2001). It is just a must to exist in the market. Companies in particular and supply chains in general compete on the basis of quality and time (Mentzer et al., 2001). Customers highly need to be delivered products consistently faster, on time delivery and with no damages. So as to achieve these, supply chain necessitates integration with suppliers and customers (Mentzer et al., 2001).

The objective of supply chain is to reduce uncertainty and risk throughout the supply chain, reducing inventory level, cycle time and processes (Sirsath and Dalu, 2015). Mentzer et al. (2001) also have added that improving profitability, competitive advantage, customer value and satisfaction in the whole supply chain are among the major purposes of the SCM. SCM is concerned on improving efficiency and effectiveness to gain the competitive advantage that could enable to attain profit. According to Gunasekaran et al. (2004), supply chain management is considered as a major component of competitive strategy through improving productivity and profitability. An effective supply chain supports to deliver products and services faster with the lowest possible cost to the market (Gunasekaran et al., 2001 and Mentzer et al., 2001).

Supply chain brings a continuous improvement through time with the help of performance measures applied. Performance measures also used to check the accountability of the internal employees of the company. Performance measurement and metrics have mainly important in goal setting, evaluating performance, indicates direction for focus (Gunasekaran et al., 2004) and supports strategy planning (Sirsath and Dalu, 2015).

2.4 Supply chain Networks

The network structure of the supply chain may vary from simple to complex. Mentzer et al. (2001) had identified three types of supply chain complexity (Fig. 2.2). These are direct supply chain, extended supply chain and ultimate supply chain. Direct supply chain consists of partners a supplier, a manufacturer and a customer which are involved in the upstream and downstream

flows of materials, services, finances, and information. The extended supply chain according to Mentez et al. (2001) also includes the suppliers of the immediate supplier and customers of the immediate customer in which all are participated in the flows of materials, services, finance and information. The ultimate supply chain includes all organizations participated in all the upstream and downstream flows of products, services, finance and information from the ultimate supplier to the ultimate customer. From this we can understand that the ultimate supply chain network is complex than the extended and the direct supply chains.

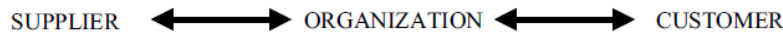


FIGURE 1a - DIRECT SUPPLY CHAIN

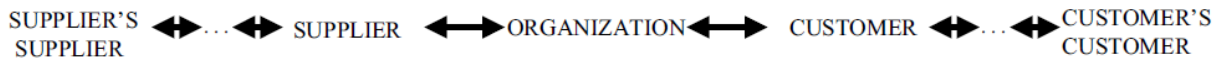


FIGURE 1b - EXTENDED SUPPLY CHAIN

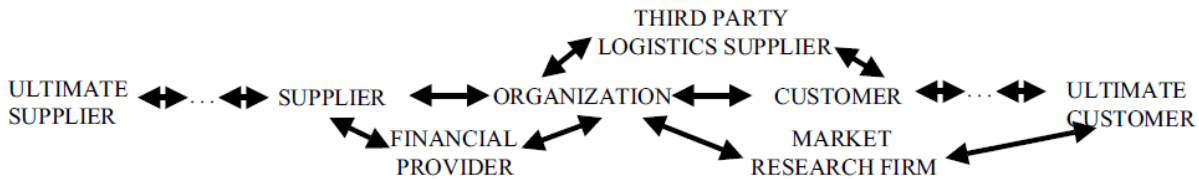


Figure 2.2 Types of channel relationships (Source: *Mentez et al., 2001*).

2.4.1 Business Process Links

“Integrating and managing all business process links throughout the supply chain is likely inappropriate” (Lambert and Cooper, 2000). There are critical and less critical links in business process due to situations and time (Lambert and Cooper, 2000). Lambert and Cooper have found four fundamental types of business process links in members of the supply chain. The first link is managed process link. Managed process links are links which are critical for focal company to manage and integrate in its supply chain (fig. 2.3). Monitored process links are not critical for the focal company but important. So that, the focal company as necessary will monitor and audits. The third type is not-managed process links. In Not-managed process links, the focal company is

not actively involved nor are they critical, the focal company left them to be managed by other members of the supply chain. The final process link is non-member process link. The non-member links are not considered as links of the focal company's supply chain structure, by they will affect the performance of the supply chain and the focal company.

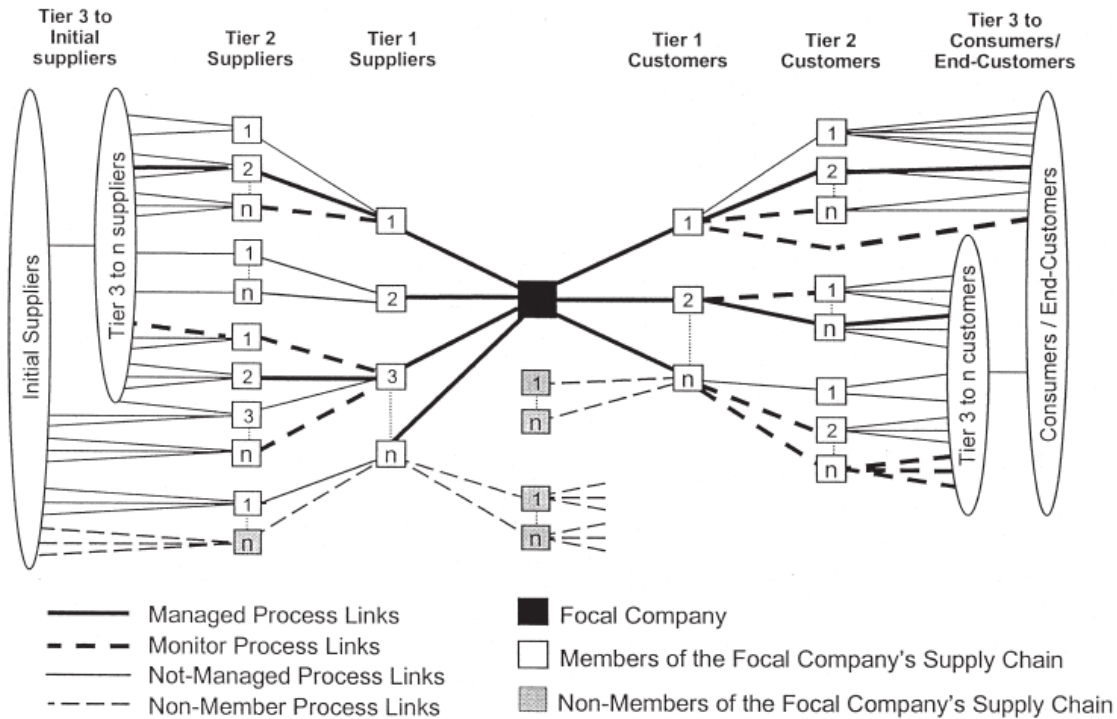


Figure 2.3 Business process links (*cited Lambert and Cooper, 2000*).

2.5 Frameworks of Supply chain Performance Measures

Even though the traditional performance measures have started in 1880s according to Gomes et al. (2001), and Bourne and Neely (2003), the concern has increased in the last few years (Neely and Adams (2001). Measures such as standard costing, variance analysis, flexible budgets, return on investment, budgetary controls and other key management ratios have been among traditional performance measures (Gomes et al., 2001, and Bourne and Neely, 2003).

Traditional measures were criticized for encouraging short term decision making, their inapplicability in modern manufacturing techniques, and damage they were causing to business (Bourne and Neely, 2003). While globalization started, these traditional measures became inefficient (Gomes et al., 2001, and Bourne and Neely, 2003). As a result, the major concern was the development of performance measurement frameworks seeking a balanced measure in the

company as well as in the supply chain (Bourne and Neely, 2003). Aiming to resolve problems of such unbalanced measure of the financial systems, frameworks such as: supportive performance measure matrix, SMART Pyramid, Result-Determinant Matrix, Balanced Scorecard (1992), Performance prism (2002), SCOR Model (1996), the framework of Cooper and Lambert, (1997) and others have been formulated to avoid the draw backs of financial measurement. These frameworks have incorporated the concept of stakeholder's satisfaction in their measurement systems (Bourne and Neely, 2003).

2.5.1 Performance Prism (Neely and Adams, 2001)

Performance prism is a three dimensional model with five facets. The top and the bottom facets are stakeholder satisfaction and stakeholder contribution respectively. The three side facets are Strategies, Processes and Capabilities.

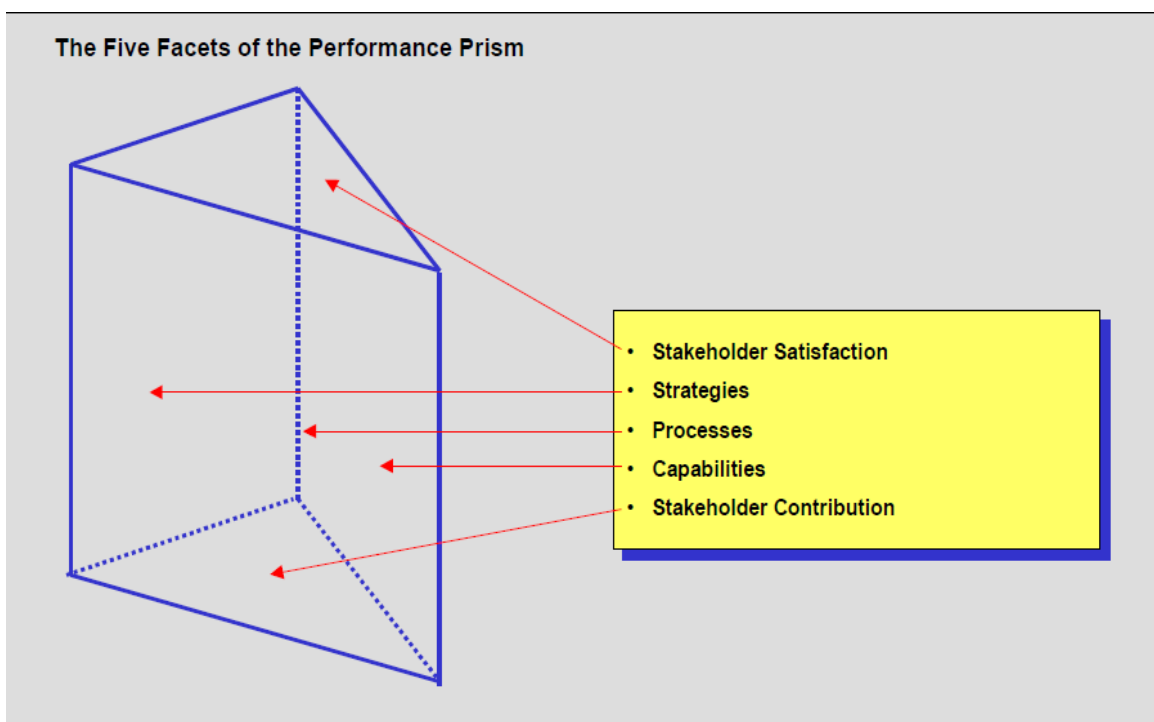


Figure 2.4 The Performance Prism Framework (Source: Neely and Adams, 2001).

- 1. Stakeholder Satisfaction:** According to the model, stakeholder satisfaction is the first and the fundamental perspective. Unlike other models, the performance measures of performance prism start with stakeholder not from business strategies. The Stakeholders for the model are investors, customers and intermediaries, employees, suppliers,

regulators and communities. The model suggests that if the organization fails to satisfy the needs and wants of its stakeholders, they probably in turn will decide to exact their revenge.

2. **Strategies:** The second perspective in performance prism is the strategies that the organization needs to adopt. The role of measurement is high through checking whether the implemented strategy works properly or not. The organization question itself: What strategies do we have to put in place to satisfy the needs and wants of these key stakeholders?
3. **Processes:** Choosing the right process which can fit the strategy is the third performance perspective of the model. The processes perspective can help its customers in delivering fast, right, cheap and easy. So that, the managers need to decide which measures are important, which metrics will be implemented and how frequently shall be measured.
4. **Capabilities:** The process needs the right match of capability to deliver the wants and needs of its customers. Among the capabilities are people with skill, policies and procedures, infrastructures and technologies.
5. **Stakeholder Contribution:** All organizations require certain things from their stakeholders and in turn organizations are responsible for delivering certain things to all of their stakeholders. So that organizations need to question themselves: What contributions does the organization need from its stakeholders if it needs to maintain and develop these capabilities?

2.5.2 Gunasekaran et al. (2001 and 2004) Performance Framework

The theoretical framework of the model has been formulated in 2001 and supported with an empirical study in 2004. The framework has four supply chain activities or processes, which are plan, source, make/ assemble and deliver. The metrics of the framework have derived from the processes and classified into strategic, tactical and operational levels. The classification assists the organization to clarify the authority and responsibility of performance to its management.

2.5.3 Balanced Scorecard (By Kaplan and Norton, 1992)

The model was one of the pioneers that drive the performance measurement from traditional financial performance measures to balanced measures of both financial and operational measures. The balanced scorecard has four perspectives: Financial, Internal Business, Customer, and Innovation and Learning perspectives. The framework has included both financial and non financial measures. In addition, the model looks both at internal and external perspectives. But, the performance framework has downplayed the importance of employees and stakeholders (other than shareholders) (Neely and Adams, 2001).

2.5.4 Supply Chain Operations Reference (SCOR) Model

Supply Chain Operations Reference Model (SCOR) is developed by Supply Chain Council (SCC). “SCC is a global non-profit consortium whose methodology, diagnostic and benchmarking tools help organizations make drastic and rapid improvements in the supply chain processes” (SCC, 2012). SCOR model is developed for evaluating and comparing supply chain activities and performance. “It provides a unique framework that links business process, metrics, best practices and technology into a unified structure to support communication among supply chain partners and improve the effectiveness of supply chain management and related supply chain improvement activities” (SCC,2012).

SCC was formed in 1996 by practitioner companies meeting in an informal. The majority of the SCC members are practitioners represented from broad cross-section of industries including manufacturers, distributors, and retailers. Technology suppliers and implementers, academics and government organizations have participated in SCC activities and the development and maintenance of the model.

The SCOR model is developed to describe the business activities associated with all phases of satisfying a customer’s demand. SCOR model contains several sections containing six management processes of plan, source, make, deliver, return and enable (SCC, 2012). Using these process building blocks, the model can be used to describe supply chains of

disparate industries that are very simple or very complex using a common set of definitions.



Figure 2.5 Six management process of SCOR model (Source: SCC, 2012).

The SCOR model spans in three interactions which are: all customer interactions, all physical material interaction and all market interaction. Customer interactions are from order entry through paid invoice. Physical interactions include activities from supplier's supplier to customer's customer, including equipments, supplies, spare parts, bulk products, software, etc). Market interactions also include the understanding of aggregate demand to the fulfillment of each order (SCC, 2012).

2.5.4.1 Scope of SCOR Model

The scope of the model has changed and anticipated for change based on the council member requirements. An introduction of "Return" in the model can be considered as an example. The return process level has extended the SCOR model in to the area of post-delivery customer support (although it doesn't include all activities in that area).

"The model is designed to support supply chain analysis at multiple levels" (SCC, 2012) as shown in (fig. 2.5). The model has focused on industry neutral top three process levels. The SCOR model doesn't attempt to prescribe the implementation of the model to a specific industry or company. While companies implement the SCOR model for the improvement of the supply chain, they will need to extend the model in to at least to level four, using industry-, organization- and /or location-specific processes, systems, and practices (SCC, 2012).





	Level		Examples	Comments
	#	Description		
Within scope of SCOR	1	 Process Types (Scope)	Plan, Source, Make, Deliver, Return and Enable	Level-1 defines scope and content of a supply chain. At level-1 the basis-of-competition performance targets for a supply chain are set.
	2	 Process Categories (Configuration)	Make-to-Stock, Make-to-Order, Engineer-to-Order Defective Products, MRO Products, Excess Products	Level-2 defines the operations strategy. At level-2 the process capabilities for a supply chain are set. (Make-to-Stock, Make-to-Order)
	3	 Process Elements (Steps)	<ul style="list-style-type: none"> Schedule Deliveries Receive Product Verify Product Transfer Product Authorize Payment 	Level-3 defines the configuration of individual processes. At level-3 the ability to execute is set. At level-3 the focus is on the right: <ul style="list-style-type: none"> Processes Inputs and Outputs Process performance Practices Technology capabilities Skills of staff
Not in scope	4	 Activities (Implementation)	Industry-, company-, location- and/or technology specific steps	Level-4 describes the activities performed within the supply chain. Companies implement industry-, company-, and/or location-specific processes and practices to achieve required performance

Figure: 2.6 SCOR hierarchical process model (Source: SCC, 2012).

2.5.4.2 SCOR Structure

The SCOR reference model consists of four major sections:

- A) Performance: standard metrics to describe process performance and define strategic goals.
- B) Processes: standard descriptions of management processes and process relationships.
- C) Practices: management practices that produce significant better process performance.
- D) People: standard definitions for skills required to perform supply chain processes.

A) Performance Section

The performance section of the SCOR model consists of two elements. These are performance attributes and metrics (SCC, 2012). A performance attribute is a categorization of metrics used to express a strategy. An attribute cannot be measured by itself but used to set a strategic direction. For example: ‘Superior performance for supply chain reliability’ or ‘Advanced performance for agility’ are business strategies applied in supply chain. Metrics measure the ability of the supply

chain to achieve these strategic attributes. Reliability is a performance attribute where as perfect order fulfillment is metric.

SCOR attributes are considered customer focused and internal focused. Reliability, responsiveness and agility are considered as customer focused. Both Cost and asset management efficiency are considered internal focused.

Table: 2.1 *SCOR Performance Attributes*

Performance Attribute	Definition
Reliability	The ability to perform tasks as expected. Reliability focuses on the predictability of the outcome of a process. Typical metrics for the reliability attribute include: On-time, the right quantity, the right quality.
Responsiveness	The speed at which tasks are performed. The speed at which a supply chain provides products to the customer. Examples include cycle-time metrics.
Agility	The ability to respond to external influences, the ability to respond to marketplace changes to gain or maintain competitive advantage. SCOR Agility metrics include Flexibility and Adaptability
Costs	The cost of operating the supply chain processes. This includes labor costs, material costs, management and transportation costs. A typical cost metric is Cost of Goods Sold.
Asset Management Efficiency (Assets)	The ability to efficiently utilize assets. Asset management strategies in a supply chain include inventory reduction and in-sourcing vs. outsourcing. Metrics include: Inventory days of supply and capacity utilization.

Source: SCC, 2012

All SCOR metrics are grouped within one of the performance attributes. Each performance attribute has one or more level-1/ strategic metrics (table 2.2). These level-1 metrics are used to calculate how successful an organization is achieving its desired positioning within the competitive market space.

SCOR metrics are organized in a hierarchical structure (SCC, 2012). SCOR describes level-1, level-2 and level-3 metrics in which the relationship is used as a diagnostic. Level-2 metrics used as diagnostics for level-1 metrics. Level-3 metrics also serve as a diagnostic for level-2 metrics. One can explain the performance of level-1 metrics from the performances of the level-2 metrics and also the level-2 metrics from level-3 metrics. This type of analysis is called decomposition or root-causing.

Table 2.2 *SCOR Level-1 Metrics*

Performance Attribute	Level-1 Strategic Metric
Reliability	<ul style="list-style-type: none"> • Perfect Order Fulfillment (RL.1.1)
Responsiveness	<ul style="list-style-type: none"> • Order Fulfillment Cycle Time (RS.1.1)
Agility	<ul style="list-style-type: none"> • Upside Supply Chain Flexibility (AG.1.1) • Upside Supply Chain Adaptability (AG.1.2) • Downside Supply Chain Adaptability (AG.1.3) • Overall Value At Risk (AG.1.4)
Cost	<ul style="list-style-type: none"> • Total Cost to Serve (CO.1.001)
Asset Management Efficiency	<ul style="list-style-type: none"> • Cash-to-Cash Cycle Time (AM.1.1) • Return on Supply Chain Fixed Assets (AM.1.2) • Return on Working Capital (AM.1.3)

Source: SCC, 2012

B) Processes Metrics

The process section provides a set of predefined descriptions for activities most companies perform to effectively perform their supply chains (SCC, 2012). There are six macro-level SCOR processes. These are Plan, Source, Make, Deliver, Return and Enable. SCOR identifies 2 more levels of process which are level-2 and level-3 as shown in Figure 2.5. A level-1 process spans multiple level-3 processes. Level-3 process is focused on a more detailed activity. Level-2 process categories determine the capabilities within the level-1 processes.

The key level-2 processes for Source, Make and Deliver are Make-to-Stock, Make-to-Order, and Engineer-to-Order. Defective, MRO, and Excess level-2 processes are for the Return process. Level-3 processes are process that are performed in a certain sequence in order to plan supply chain activities, source materials, make products, deliver goods and services and handle product returns.

When companies implement SCOR model, they may develop standard process descriptions of activities within the level-3 processes so called level-4 processes (SCC, 2012). Level-4 processes are industry, product, location and/technology specific. For example: `Receive, enter and validate a customer order` (sD1.2) is a level-3 process. The leve-4 processes would describe the steps how the order was received. It would be in the form of EDI, fax, telephone, and walk-in.

Process codification differs for process levels. Level-1 processes are represented by a capital letter preceded by the letter s (this silent s in small caps stands for SCOR). sP for Plan, sS for Source, sM for Make, sD for Deliver and sR for Return. Level-2 processes add a number in level-1 representation: sD1-deliver stocked product. Level-3 processes add a period followed by a unique number: sD1.2 receive, enter and validate order. There exists an exception for Return processes. Level-2 Return processes are split into Source Return (sSRx) and Deliver Return (sDRx) processes to acknowledge between returning something yourself or receiving a return from your customer. The level-3 processes of Return are aligned with these codes: sDR1.1 authorize defective product return.

C) Practice Section

The practice section of the SCOR model, known as ‘best practices’, provides a collection of industry-neutral practices in which companies have recognized for their value. A practice is a unique way to configure a process or a set of processes. The uniqueness can be related to the automation of the process, a technology applied in the process, special skills applied to the process, a unique sequence for performing the process, or a unique method for distributing and connecting process between organizations (SCC, 2012).

SCOR recognizes different qualification of practices within any organization. These are:

- ✓ Emerging Practices (BP.E)
- ✓ Best Practices (BP.B)
- ✓ Standard Practices (BP.S)
- ✓ Declining Practices (BP.D)

The qualification of a practice in SCOR may vary by industry or geography. A standard practice for one industry may be emerging or best practice for the other industry while the qualification practice is the same.

D. People Section

The people section of the SCOR provides a standard for describing skills required to perform tasks and manage processes. These skills are supply chain specific. Skills are described by a standard definition and association to other people aspects: Aptitudes, Experiences, Trainings

and Competency level. According to SCOR, there are five recognized accepted competency levels (SCC, 2012). These are:

- ✓ Novice: untrained beginner, no experience required and follows detailed documentation.
- ✓ Beginner: Performs work with limited situational perception.
- ✓ Competent: Understands the work and can determine priorities to reach goals
- ✓ Proficient: Oversees all aspects of the work and can prioritize based up on the situational aspects.
- ✓ Expert: Intuitive understanding. Experts can apply experience patterns to new situations.

According to SCOR, these competency levels are used similarly as a process or practice maturity levels.

2.6 Conceptual Framework of the Study

Scholars and practitioners have formulated frameworks for the measurement of business performance. These frameworks seems conflicting each other (Neely and Adams, 2001). But the reality is not like that. They all assist managers to measure the performance of the organization from different perspectives. If the manager focuses on short-term shareholders value, the organization might use a short term approach to measure its performance. On the other hand, if the manager needs to give attention to customers, employees, competition and others, he/ she will use a performance framework which matches to its objectives.

Even though there are number of conceptual frameworks and discussions on performance measurement systems in the supply chain, there are gaps in supporting the frameworks with an empirical and case studies in (Gunasakaran et al., 2004). The SCOR model is one of the popular supply chain framework used to measure the performance of the organization. The model has been used in different continents and business sectors. There are thousands of organizations which implement SCOR model. Adopting SCOR model in organizations helps to solve the five top supply chain challenges (SCC, V.10). These are achieving superior customer service, controlling cost, planning and risk management, supplier/ partner relationship management and talent acquisition.

The SCOR model used to evaluate and compare the supply chain activities. It incorporates both financial and non-financial measures, internal and external measures of performance, revised as

needed by the council members, and it can also be adopted for every businesses. The researcher used the five variables of the SCOR model for the study (as shown in figure 2.6). The independent variables are reliability, responsiveness, agility, supply chain cost and supply chain asset management. The dependent variable is the supply chain performance.

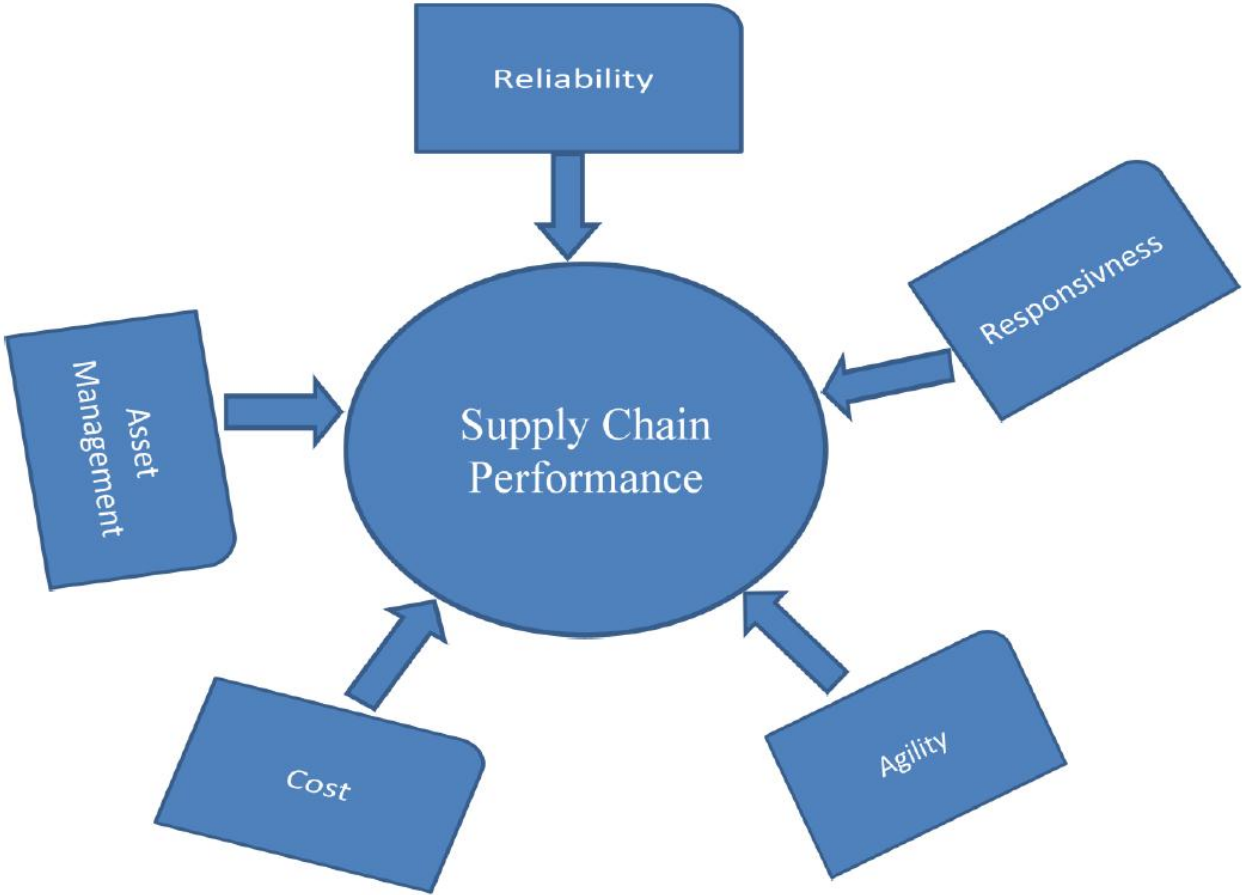


Figure 2.7 Conceptual Framework of the Study (Adopted from SCC, 2012)

CHAPTER THREE

Research Design and Methodology

3.1 Introduction

In this chapter, the research methodology deployed to investigate the stated problem have described in detail. The research design, research approach, population and sampling, data sources and types of data, data collection procedure, ethical consideration, data analysis and validity and reliability of the instrument have discussed.

3.2 Description of the Study

The research study is undertaken on examining the supply chain performance of brewery companies in Ethiopia, the case breweries. There are five brewing companies in Ethiopia with 12 plants in the country. There is a high competition among breweries in the market. The supply chain performance of these brewing companies also plays a prominent role to go well with a competitive advantage over other brewing companies. The researcher is initiated to examine the supply chain performance of the case brewery companies for the research study.

3.3 Research Approach

There are five types of research approaches. These are exploratory, descriptive, explanatory, predictive, and evaluative. Exploratory type of research is conducted for which researches are few or not yet studied before. It provides an insight in to an issue or situation for more investigation later. Descriptive research approach used to describe the state of affairs as it exists. It describes, analyzes, compare and contrast, classify, and interpret the issues under study. Explanatory research approach also used to establish the cause and effect relationship between variables. It mainly answers a question of “why? Evaluative research approach examines the magnitude of one variable on the other variable. Predictive research approach also used to predict the effect of one variable on the other variable.

To examine supply chain performance of the case brewery companies, the researcher found convenient a descriptive research approach. The research study examines and presents the performance of the supply chain as it exists. The performance of the supply chain with regard to

the five variables of reliability, responsiveness, agility, supply chain cost and supply chain asset management will be described and presented.

3.4 Research Design

According to Creswell (2013), there are three types of research designs. These are qualitative, quantitative and mixed research. Qualitative research design gathers data in the form of description not in numbers and don't quantify results through statistical analysis. Qualitative research design collects data using techniques of focused group discussion, in-depth interview, projective techniques, observation and case study.

On the other hand, quantitative research concentrates on collecting and analyzing numerical data and applying statistical tests for the analysis of the study. It used to develop and employ mathematical models, theories, and hypotheses pertaining to natural phenomena. It uses survey and experiments of data collection methods. Mixed research combines both qualitative and quantitative research designs. According to Creswell and P. Clark, (2007), mixed research is more than collecting and analyzing both types of data rather using both in tandem to get the overall strength of a study.

The researcher found that mixed research design is an appropriate measure to use for the research study. The researcher collects a cross sectional quantitative and qualitative primary data from the case breweries of companies, brewery customers (distributors) and common suppliers for both breweries. The quantitative data is collected through self administered questionnaire with a five points Likert scale. Qualitative data with semi-structured interview questions also collected from the supply chain managers of the case breweries, brewery customers (distributors) and suppliers.

3.5 Population and Sampling

The researcher undertakes census study in case breweries. The rationale behind using census sampling was its manageable size of the population in the supply chain. The staff members with a position of team leader and manager in the case breweries are considered in the study. Using judgmental sampling, seeking key informants of the supply chain, two managers from each brewery were selected for an interview.

The researcher has taken suppliers and distributors which are found in Addis Ababa due to resource constraint. Again seeking to get key informants, the researcher has used judgmental sampling in the selection of respondents from suppliers and distributors.

Table 3.1 population and sampling

S.No.	Supply Chain Actors		Population	Respondents of	
				Self-administered Questionnaire	Semi-structured Interview
1	BGI		26	24	2
2	Habesha		22	20	2
3	No. of suppliers		7	7	5
4	No. of distributors of	BGI	5	5	2
		Habesha	4	4	2
	Total			60	13

Source: Research data, 2019

3.6 Data Sources and Types of Data

The research study used cross-sectional primary data which is collected directly from respondents. Based up on the literature reviews in the supply chain management and SCOR model, self-administered questionnaire and semi-structured interview questions are prepared. Both data are collected from the respondents of the case brewery companies, customers and suppliers whose responsibilities are directly related with the execution of supply chain operation in their respective company.

The data sources for the research study are the two case brewery companies, distributors of breweries and common suppliers of breweries. The respondents of the case breweries were working in departments of sourcing (procurement), planning, warehouse, logistics, production, packaging, finance and quality.

The researcher takes the list of employees from case breweries whose position is supervisor or team leader and above. The researcher breaks down the questionnaire into departments in order to fit the respondents experience and get the reliable data for the research study. The planning manager, Logistics manager, procurement and warehouse manager of the two case breweries

have had a semi-structured interview. The rest employees have participated in self administered questionnaire.

The researcher also collects data through questionnaire from five distributors of BGI brewery and four distributors of Habesha brewery S.C. Questionnaire data also collected from seven suppliers of both breweries. Two distributors from each brewery have had semi-structured interview. Semi-structured interview also undertook with the five common suppliers of both breweries.

3.7 Ethical Consideration

The researcher requests the case brewery companies, suppliers and distributors with a supporting letter written from the University to get the approval of undertaking a research study. After the approval of the request from these supply chain actors, the respondent's and interviewee's consent was gained which it increases the quality of the data. The researcher also respects the rights of anonymity and confidentiality of the respondents and interviewees.

Based up on this, the questionnaire was distributed to respondents and the interview was done. Respondents were also informed to ask if there exists an ambiguity in the process of answering the measurement. Finally, the researcher appreciated the respondents and interviewees for their cooperation for the fulfillment of the research study.

The researcher also kept the confidentiality of the case breweries during analysis, conclusion and recommendation by converting them into company A and B.

3.8 Data Analysis

The researcher analyzed the collected data to reach at conclusion. The quantitative data are analyzed using a descriptive statics with a help of statistical tool called SPSS (version 20). The four commonly used measures of the averages are mean, median, mode and midrange. Mode is the only measure of central tendency that can be used in finding the most typical case when the data are nominal or categorical (Bluman, 2009). The researcher has used mode to conclude the overall performance of the supply chain. The results of the study are discussed and presented in the form of percentages and table. The qualitative data collected through audio recorder have

converted into a written form. The interview data with similar idea are grouped, organized, analyzed.

According to SLG (2014), the supply chain performance of breweries could be classified into three. These are superior, advantage and parity for their supply chain performance scoring more than 90, between 75 and 90, and less than 75, respectively. For the purpose of the analysis, the researcher has classified the performance of the breweries as best, better and low performance.

3.9 Reliability and Validity

Reliability

According to Leary, a good measure possesses reliability. Reliability is the consistency or dependability of the measurement. Leary listed the five reasons for the measurement error to happen. These are the transient states of the participant (mood, health, level of fatigue, and felling of anxiety), stable attributes of participant (paranoid or suspicious respondents and unmotivated participants), situational factors, characteristics of the measure itself (ambiguous and too long questions) and mistakes while recording the response of the participant.

To avoid these possible measurement errors, the researcher requests the respondents to answer the questionnaire when they will get free time and have good mood. The researcher also convinced respondents as their response will be used only for the purpose of the research study for partial fulfillment of the field studying by declaration along with oral discussion. The researcher derived the questionnaire from SCORE Model metrics used to measure performance attributes. The researcher has done double check the recordings of the respondent's response in order to avoid the mistakes made during encoding of the data.

The most common technique used to assess the reliability is Cronbach's Alpha Reliability coefficient. According to George and Mallery (2003), Cronbach's Alpha coefficient > 0.90 is Excellent, > 0.8 is Good, > 0.7 is Acceptable, > 0.6 is Questionable, > 0.5 is Poor and < 0.5 is Unacceptable. The reliability test (internal consistency) was conducted for the quantitative data collected through questionnaire using SPSS and the test result is presented in table 3.1.

Validity

A measure need not only to be reliable but also valid. According to leary, validity is the extent to which a measurement measures what is intended to measure. It answers, are we measuring what we think we are measuring? The measurement is commented by two professionals who are working in brewery industry. Based up on the comment, the researcher undergoes to collect the data.

Table 3.2 Cronbach's Alpha Coefficient Result

S.No.	SCOR Model Performance Attributes	Cronbach's Alpha Result
1	Reliability	0.817
2	Responsiveness	0.747
3	Agility	0.969
4	Supply Chain Cost	0.791
5	Supply Chain Asset Management	0.738

Source: Research data, 2019

CHAPTER FOUR

Data Presentation, Analysis and Interpretation

4.1 Introduction

As discussed in previous chapters, this thesis is aimed at examining the supply chain performance of selected breweries in Ethiopia, the case of BGI and Habesha Brewery S.C which are currently operating in Ethiopia. These breweries cumulatively have a lion share of 72% (54% BGI and 18% Habesha) in Ethiopia market. The chapter is organized to present the collected data from those two brewery companies, their common suppliers, and their product distributors. The researcher has collected the data in the form of five-point Likert scale questionnaire and semi-structured interview. The researcher has collected the data using purposive sampling from where the researcher believed that the right information about the supply chain actors can be obtained.

The researcher has distributed the customized questionnaire to 44 employees of both brewery companies found in Addis Ababa and Debre Berhan (20 for Habesha Brewery with 95% response rate and 24 for BGI Brewery with 83.33% response rate). The researcher also distributed the questionnaire to 7 common suppliers of both breweries and collected 100% response rate. The researcher also distributed 10 questionnaires to 10 customers of both breweries (4 questionnaires for Habesha Brewery with 100% Response rate, and 5 questionnaires for BGI's Customers, with 83.33% response rate). The quantitative data collected in the form of questionnaire is analyzed using SPSS (version 20). The qualitative data collected using structured interview is also analyzed and discussed in this chapter.

4.2 Respondents Demography

The demographic characteristics of the respondents of the study are shown in table 4.1 below. The proportion of male and female, age, educational background, work experience, departments in the breweries, suppliers of both breweries and distributors found in Addis Ababa are described.

Table 4.1 Respondents demography

Item	Category	BGI	Habesha	Suppliers	Distributors	Total	Percent (%)
Sex	Male	18	11	6	7	42	76.4
	Female	2	8	1	2	13	23.6
	Total	20	19	7	9	55	100
Age	Under 25 years	-	2	-	-	2	3.6
	25 to 30 years	4	10	1	3	18	32.7
	31 to 40 years	12	7	1	5	25	45.5
	Above 40 years	4	-	5	1	10	18.2
	Total	20	19	7	9	55	100
Level of Education	College Diploma	1	-	-	2	3	5.5
	BA/ BSc Degree	9	16	6	7	38	69.0
	MA/ MBA/MSC Degree	10	3	1	-	14	25.5
	Total	20	19	7	9	55	100
	Work Experience	Below 2 years	1	1	-	-	2
2 to 5 years		2	6	1	3	12	21.8
5 to 10 years		6	9	-	4	19	34.5
Above 10 years		11	3	6	2	22	40.0
Total		20	19	7	9	55	100
Department in Breweries	Warehouse	1	1			2	5.0
	Logistics	2	3			5	13.0
	Procurement	3	4			7	18.0
	Planning	2	1			3	7.5
	Production	3	2			5	13.0
	Packaging	3	2			5	12.8
	Quality	2	2			4	10.5
	Finance	4	4			8	20.5
	Others						
	Total	20	19			39	100

Source: Research data, 2019

According to table 4.1, most of the respondent's age is found in the category from 30 to 40 and 25 to 30, with percentage of 45.5% and 32.7% respectively. The level of education of the study for BA/BSc Degree is 69.1% and for MA/MBA/MSc degree is 25.5 % with a total of 94.6%, which means that most of the respondents for the study can understand and respond the self administered questionnaire. The 40% of the respondent's work experience is above ten years followed by 34.5% and 21.8% from 5 to 10 years and 2 to 5 years respectively. There are 39 respondents of both breweries. The research study also incorporates 7 suppliers with 1 respondent in each supplier. Distributors of both breweries found in Addis Ababa are nine and all of them have been considered in the study.

4.3 Self-administered Questionnaire Analysis

The four commonly used measures of the averages are mean, median, mode and midrange. The researcher used mode as a measure of average to examine the supply chain performance of the breweries. In this study, the researcher has used likert scale for collecting the raw data through structured questionnaire. The questionnaire is prepared with five point likert scale method, where 1 stands for strongly disagree, very low, very high and very long (the poor performance in the supply chain) and where 5 stands for strongly agree, very high, very low and very Short (the best performance). For the purpose of the analysis, the researcher has used the SLG (2014) classification of performance measure. The level of agreement (mode) 5 is considered as the supply chain performance is high (best performance) while the level of agreement (mode) 4, the supply chain performance is better (advanced performance). When the level of agreement is equal to or less than three, the researcher considered that the supply chain performance is low (poor performance), which means that the supply chain needs attention for an improvement.

First Research Question: To what extent are breweries supply chains reliable to their distributors?

According to the data in table 4.2, with twelve performance metrics of reliability, the mode score for eleven performance metrics is 5 (100%) for company A, which means that the reliability performance of company A is best with these performance metrics. Company A has also scored 4 (80%) in delivering defect free (under fill) product, which means that it is in advanced

performance in this performance metrics. Whereas, the mode score for eight performance metrics of company B is 5 (100%), which means that company B's reliability performance is best in these metrics. On the other hand, in four performance metrics of reliability, company B scored 4 (80%) which means that it is in an advanced performance in these metrics.

Based up on the scores presented on table 4.2, one can infer that most of the performance metrics of reliability of both companies are in best performance. But, the supply chain of company A (91% of mode score) can be said that more reliable than company B (66.6% of mode score) to their distributors/ customers.

Table 4.2 *Supply chain reliability of the breweries*

SCOR Code	Statements	Company A					Company B				
		N	Min	Max	Mode	% of Mode	N	Min	Max	Mode	% of Mode
RL.3.33	Brewery/ supplier delivers the ordered item accurately	12	4.00	5.00	5.00	75.00	9	3.00	5.00	4.00	61.50
RL.3.35	Brewery/ supplier delivers the ordered quantity accurately	12	4.00	5.00	5.00	58.00	9	4.00	5.00	5.00	53.00
RL.3.32	Brewery/ supplier achieves the commit date	11	4.00	5.00	5.00	54.00	8	3.00	5.00	4.00	58.50
RL.3.34	Brewery/Supplier delivers the order to the correct location and customer	8	4.00	5.00	5.00	62.50	4	4.00	5.00	4.00	50.00
RL.3.31	Supplier readily available compliance documentation	15	2.00	5.00	5.00	66.70	17	2.00	5.00	5.00	52.90
RL.3.43	Supplier readily available required documentation	15	3.00	5.00	5.00	73.30	17	3.00	5.00	5.00	64.70
RL.3.45	Supplier readily available payment documentation	22	4.00	5.00	5.00	68.20	19	3.00	5.00	5.00	56.50
RL.3.50	Supplier readily available shipping documentation	19	3.00	5.00	5.00	73.70	21	3.00	5.00	5.00	42.90
RL.3.50	Brewery readily available shipping documentation	12	4.00	5.00	5.00	75.00	8	3.00	5.00	5.00	50.00
RL.3.24	Brewery/Supplier deliver breakage free product	20	4.00	5.00	5.00	60.00	17	4.00	5.00	4.00	66.70
RL.3.42	Brewery/Supplier deliver defect (under fill) free product	17	4.00	5.00	4.00	58.00	13	4.00	5.00	5.00	52.90
RL.3.55	The commitment of the brewery/supplier to returns of its product	17	4.00	5.00	5.00	70.00	13	4.00	5.00	5.00	76.50

Source: research data, 2019

Second Research Question: To what extent are breweries supply chains responsive to the market demand?

As indicated in the table 4.3, with fifteen performance metrics of responsiveness, the mode score for thirteen performance metrics is 4 (80%) for company A, which means that the responsiveness performance of company A is advanced with these performance metrics. Company A has also scored 5 (100%) in two performance metrics of responsiveness, which means that it is in best performance in these performance metrics.

Whereas, in company B, the mode score for eight performance metrics is 5 (100%), which means that company B's responsiveness performance is best in these metrics. On the other hand, in seven performance metrics of responsiveness, company B scored 4 (80%) which means that it is in advanced performance in these performance metrics.

As it is indicated on table 4.3, most of the performance metrics of responsiveness of company A are in advanced performance and company B's are in best performance. So that, one can say that company B's supply chain is more responsive than company A's supply chain.

Table 4.3 Supply chain responsiveness of the breweries

SCOR Code	Statements	Company A					Company B				
		N	Min	Max	Mode	% of Mode	N	Min	Max	Mode	% of Mode
	Source Cycle Time										
RS.3.108	The material receiving cycle time of the brewery	15	3.00	5.00	4.00	73.30	17	1.00	5.00	5.00	48.10
RS.3.140	The material quality verification cycle time of the brewery	15	4.00	5.00	4.00	73.30	17	3.00	5.00	5.00	52.90
RS.3.8	The authorize supplier payment cycle time of the brewery	16	3.00	5.00	5.00	50.00	17	2.00	5.00	4.00	41.20
	Make Cycle Time										
RS.3.123	Schedule production activities cycle time of the brewery	10	2.00	5.00	4.00	50.00	7	2.00	5.00	4.00	71.40
RS.3.49	Issue materials cycle time of the brewery	10	2.00	5.00	5.00	60.00	7	3.00	5.00	5.00	42.90
RS.3.101	Brewing and quality test cycle time of the brewery	12	2.00	5.00	4.00	58.30	9	3.00	5.00	4.00	55.60
RS.3.142	Beer packaging cycle time of the brewery	12	3.00	5.00	4.00	50.00	9	3.00	4.00	5.00	77.80
RS.3.114	Release finished product to warehouse cycle time of the brewery	12	4.00	5.00	4.00	66.00	9	4.00	5.00	4.00	66.70
	Delivery Cycle Time										
RS.3.116	The average time for reserving resources and determining a delivery date	3	4.00	5.00	4.00	66.00	5	3.00	5.00	4.00	80.00
RS.3.18	The average time required for customer order consolidation	3	4.00	5.00	4.00	66.70	4	3.00	5.00	4.00 ^a	50.00

RS.1.12 4	The average time required for selecting the type of the trucks	3	4.00	5.00	4.00	66.30	4	4.00	5.00	5.00	50.00
RS.3.51	The average time associated with product loading of trucks	8	3.00	5.00	4.00	62.50	8	3.00	5.00	4.00	50.00
RS.3.51	The average time associated with generation of shipment documents	3	4.00	5.00	4.00	66.70	4	4.00	5.00	5.00	50.00
RS.3.12 6	The average time required for shipping orders	8	4.00	5.00	4.00	62.50	8	4.00	5.00	5.00	62.50
RS.3.10 2	The average time required for receiving and verifying an order at customer site	8	3.00	5.00	4.00	62.50	8	3.00	5.00	5.00	50.00

a. Multiple modes exist. The smallest value is shown

Source: Research data, 2019

Third Research Question: To what extent are breweries supply chains flexible and adaptable to market changes?

As shown in table 4.4, out of ten agility performance metrics, the mode score of five performance metrics of company A is 3, three metrics with a mode score of 5 and 2 metrics with a mode score of 4. On the other hand company B, the mode score of four performance metrics of agility is 4, three metrics with a mode score of 5 and three metrics with a mode score of 3. From this, one can understand that, company A is said to be poor in supply chain agility performance with most mode 3 and company B is in advanced performance with most mode 4.

Company A scored a minimum mode score of 1 (which is very long) for “the number of days required to achieve an unplanned sustainable increase in production”. Company A also scored a minimum mode of 1 (Very Low) for “the maximum sustainable increase in production quantity that can be achieved”. From these responses, one could say that, company A is less agile in both upside flexibility and adaptability. Even though both companies are not best performers in agility, company A is less agile as compared to company B. With regard to overall value at risk, both companies scored very low risk of the supply chain from internal and external risks.

Table 4.4 Supply chain agility of the breweries

SCOR Code	Statements	Company A					Company B				
		N	Min	Max	Mode	%of Mode	N	Min	Max	Mode	% of Mode
	AG.1.1 Upside Supply Chain Flexibility										
AG.2.2	The number of days required to achieve an unplanned sustainable increase in quantity of materials	12	1.00	5.00	3.00	50.00	12	1.00	4.00	3.00 ^a	34.30
AG.2.2	The number of days required to achieve an unplanned sustainable increase in production	8	1.00	5.00	1.00	62.50	5	3.00	4.00	3.00	60.00
AG.2.3	The number of days required to achieve an unplanned sustainable increase in quantity delivered	7	3.00	5.00	3.00 ^a	42.90	5	3.00	5.00	4.00	60.00
AG.2.5	The number of days required to achieve an unplanned sustainable increase in the return of finished goods	2	4.00	5.00	4.00 ^a	50.00	1	5.00	5.00	5.00	100.00
	AG.1.2 Upside Supply Chain Adaptability										
AG.2.6	The maximum sustainable increase in raw material quantity that can be acquired	14	2.00	5.00	2.00 ^a	28.60	12	2.00	5.00	3.00	50.00
AG.2.7	The maximum sustainable increase in production quantity that can be achieved	10	1.00	5.00	1.00	50.00	4	3.00	4.00	4.00	75.00
AG.2.8	The maximum sustainable increase in quantity delivered that can be achieved	9	3.00	5.00	4.00	66.70	5	4.00	5.00	4.00	60.00
AG.2.10	The sustainability of the brewery for an increase in finished goods returned	4	3.00	5.00	5.00	75.00	1	4.00	4.00	4.00	100.00
	AG.1.4 Overall Value at Risk										
AG.2.14	The value at risk of the supply chain actors which can cause a process failure or disruption	11	4.00	5.00	5.00	63.00	9	3.00	5.00	5.00	44.40
AG.2.15	The probability of external risk event like hurricane, earthquake, political instability, etc in the supply chain of the brewery	11	4.00	5.00	5.00	63.60	9	3.00	5.00	5.00	55.60

Source: Research data, 2019

Forth Research Question: To what extent are brewery companies managing their supply chain operating cost?

According to the data in table 4.5, except the two cost performance metrics, others metrics scored with a mode of less than 3, which means that company A's supply chain cost is high. On the other hand, except one cost performance metrics, others metrics scored a mode of less than 3, as the same as company B, in meaning high supply chain cost. Both company supply chains are poor in managing supply cost.

The total cost associated with managing order, receiving, inspection and warehousing of materials for company A is with very low cost, but medium for company B for this performance indicator. In addition, the cost of imperfect deliveries to customers is very low for both breweries.

As the qualitative data collected from semi-structured interview indicates, company A didn't has inventory and warehousing costs for full products which means that it has decreased its supply chain cost. On the other hand, company B holds full products for six days sales in its plant warehouse as well as in regional warehouses. This increases the cost of inventory and warehousing for company B as compared to company A. As both companies work with highest quality control starting from raw material receiving, in the process of brewing as well as in packaging the product, the cost of imperfect deliveries to customers is very low.

Table 4.5 Supply chain cost of the breweries

SCOR Code	Statements	Company A					Company B				
		N	Min	Max	Mode	%of Mode	N	Min	Max	Mode	% of Mode
CO.2.001	The total cost of personnel, automation, assets and overhead associated with supply chain planning processes	6	1.00	5.00	2.00	33.30	5	2.00	3.00	2.00	80.00
CO.2.002	The total cost associated with managing order, receiving, inspection and warehousing of materials	6	1.00	5.00	5.00	33.30	5	2.00	4.00	3.00	60.00
CO.2.003	The material landed cost (actual price and expense paid) of location of use for packaging and raw materials	5	2.00	3.00	3.00	80.00	4	2.00	4.00	3.00	50.00
CO.2.004	The total cost associated with managing and performing production processes	12	2.00	4.00	3.00	75.00	9	2.00	4.00	3.00	66.70
CO.2.005	The total cost associated with receiving an order, scheduling transport, order tracking and tracing, invoicing to customer	8	2.00	5.00	3.00	50.00	5	2.00	5.00	3.00	40.00
CO.2.006	The fulfillment cost of an order to the customer	8	2.00	3.00	2.00 ^a	50.00	5	2.00	4.00	2.00 ^a	40.00
CO.2.007	Cost of imperfect delivery to customer (defective, excess and returns)	8	3.00	5.00	5.00	75.00	5	3.00	5.00	5.00	60.00

a. Multiple modes exist. The smallest value is shown

Source: Research data, 2019

Fifth Research Question: To what extent are brewery companies efficiently utilizing the supply chain assets?

According to table 4.6, the cash to cash cycle time of company A scored a mode of 5 for 75% of the performance metrics of asset management, which means that company A is best performer. On the other hand, company B's cash to cash cycle time for 50% of the supply chain asset performance metrics scored 3, which mean that it is with advanced cash to cash cycle time.

With two performance metrics to measure the return on supply chain fixed assets of breweries, both companies scored a mode of 4 which mean that they are performing in advanced supply chain performance. In general, 50% of the performance metrics showed that company A is best performing in its supply chain asset management. On the other hand, 50% of the performance metrics of supply chain asset management indicate that it is advanced performance.

Table 4.6 *Supply chain asset management of the breweries*

SCOR Code	Statements	Company A					Company B				
		N	Min	Max	Mode	%of Mode	N	Min	Max	Mode	% of Mode
	AM.1.1 Cash-to-cash Cycle Time										
AM.2.2	The length of time from sale is made to cash received from customers	9	3.00	5.00	5.00	45.40	9	2.00	5.00	5.00	45.40
AM.3.16	The length of inventory days of raw materials	14	2.00	5.00	3.00	42.90	15	2.00	5.00	3.00	40.00
AM.3.45	The length of inventory days of finished goods	11	4.00	5.00	5.00	54.50	11	3.00	5.00	4.00	45.50
AM.2.3	The length of time from purchase of raw materials to cash payments	12	2.00	5.00	5.00	41.70	13	2.00	4.00	3.00	38.50
	AM.1.2 Return on Supply Chain Fixed Asset										
AM.1.2	The return an organization receives from capital investment in supply chain fixed assets	6	4.00	5.00	4.00	66.70	5	3.00	4.00	4.00	60.00
AM.1.3	Revenue generated relative to working capital invested on supply chain	6	3.00	5.00	4.00	50.00	5	3.00	4.00	4.00	60.00

Source: *Research data, 2019*

4.4 Semi-structured Interview Questions Analysis

In addition to the quantitative data, the researcher has also collected qualitative data from key informants of two case breweries (two from each). A structured interview was held with the planning manager, Logistics Manager, Procurement Manager and Warehouse Manager. Four respondents of the interview were intentionally selected aiming to get optimal information from different departments. Employees in these positions were key informants for the research study since they are professional, knowledgeable and experienced. In addition, they are in higher positions and working directly in the supply chain of their corresponding breweries.

The semi-structured interview data are also collected from the five common suppliers (one from each) of both breweries. The positions of the interviewees are Sales and Marketing manager, Sales manager, Chief Operation manager, General Manager, and General Manager and Finance Director. These respondents of the study are also the key informants of the study for the performance of the supply chain between the supplier and the brewery.

Lastly, the researcher has collected an interview data from four product distributors (two from each) of breweries. The collected data have been used to measure the performance of the supply chain in distributors and brewery.

4.4.1 Breweries Qualitative Data Analysis

Reliability performance of the supply chain

In order to get an in depth insight to the performance of the supply chain of the two breweries, qualitative data collected from the four managers of the two case breweries are summarized and presented.

The researcher has interviewed the company managers about the extent their reliability to distributors or customers. One of the managers of company A has replied that *“I do believe that the brewery is 95% reliable to distributors.”* The same question was also forwarded for one of Company B manager and he replied that even though we didn’t measure the reliability in the form of an organized manner, the brewery is much reliable to its distributors. Both company Managers has explained the reliability of the company as follows: *“The brewery fulfills the*

distributor's need in terms of product type, quality, quantity, and the brewery deliver products either to distributor's warehouses or the distributors receive at breweries on the commit date".

The researcher has also asked both company managers about the product returns. Both of them have replied that *"full goods product return from customers is almost zero."* That is because both breweries request advance payment or immediate payment from distributors. But, both of them said that the company is willing to receive any product return product from its customers. The researcher has also asked these managers the level of defective product return from distributors. Both company managers have replied *"Defective products including breakages of bottle having the crown cork, under fill beer and change in the test of the beer will be returned at any time"*. According to the interview data, breweries use electronic control mechanism called EBI to control the broken and under filled bottles. In addition, both breweries undertake repetitive quality tests for the test of the beer starting from brewing, packaging and finally after the beer is packed into bottles and kegs. Brewery Managers said *"even though the level of defective product is very low, there is a clear procedure which is set to be followed for defective products return. The returned defective product will be examined by quality department. After the investigation of reasons, distributors will be replaced with good product for the returned amount."* The researcher has also asked both company managers the amount of time it takes to replace. Company A manager has said that it will take about a week and company B manager replied that it will take not more than two days.

The researcher has asked both company managers the way they are managing their warehouse and transport. The two breweries have different view of warehouse management but similar view about their transport management. According to the interview data, company A collects customer orders in its respective sales representative, and then production will be undertaken. According to the manager of company A, *"the brewery uses make to order strategy. The company collects orders from its distributors and delivers the produced product to customers"*. Company A manager said that the brewery pushes the distributors to have stock in their warehouses. The distributors also push the outlets to have more stock. In doing so, company A believed that it decreases the cost of supply chain.

On the other hand, Company B manager said that the brewery has warehouse in the plant and in regional distribution areas. The company pushes to fill the maximum level of stock as per the

standard set for locations. The manager believed that this assists the company to hold full goods stock for contingency of six days and more. So that, the distributors of company B don't need to have warehouses of their own. They always bought from the company warehouses near to them and distribute the products to outlets. According to Company B manager, even though the cost of the warehouse is high, it enables the company to be more responsive for distributors and the end user of the product at large.

Company A and B also shared similar strategy about transport management. They didn't have more than ten trucks for each brewery. Both companies used rental trucks from 3PL to distribute their product all over the country. According to the interview data from both company managers, both companies reached at conclusion to outsource the transport and focus on the core business of the brewery. Even though this enables both companies to turn their attention on the core business of the brewery, both managers said that outsourcing of the transport drives the breweries to incur high cost in the supply chain.

Responsiveness performance of the supply chain

In order to see the sourcing cycle time of the brewery, the researcher has asked the managers of the brewery about the practices they did with their suppliers. According to the interview data, to avoid the stock out problem, they build a stock of three to six month for sourced items in the country and from six months to a year for those items sourced abroad. The breweries also have long term contracts with their suppliers.

The researcher asked both company managers for the capability of their production volume if there is an unplanned sustainable increase in demand in the market. Both company managers indicated that both companies are producing at their maximum capacity and there is no chance to increase the capacity of the plant at the moment. In order to full fill such customer demands, both companies need to have an expansion phase which it could take long time, may be more than two years excluding the challenge related with foreign exchange.

According to the managers of both companies, offloading of empty containers and product loading could be held by either casual workers, forklifts or a combination. It will take four hours while the trailer trucks are offloaded and loaded by casual workers, where as using a

combination it takes only two hours. Both company managers believed that offloading and loading of trucks takes long time.

Agility performance of the supply chain

As the interview data with distributors showed, both breweries can deliver the unplanned sustainable increase in quantity demanded by their distributors within short periods. But, company A has limitations to deliver unplanned sustainable increase in quantity delivered. On the other hand, company B can deliver the unplanned sustainable increase in quantity delivered using its warehouse near to customers.

According to the interview data, both breweries are using their maximum production capacity. So that, they are unable to increase unplanned sustainable increase in production. Due to this, both breweries are less flexible and adaptable to the market changes.

Cost performance of the supply chain

As summarized on the reliability part of the interview above, since sourcing cycle time from abroad is long. Some materials procured in the country from importers also might be stock out due to foreign exchange or customs processes. In order to avoid these uncertainties, both companies are forced to have more stock than they thought to have. Brewery managers said that due to these factors, breweries build a stock for 6 months and more for items sourced from abroad. From this, one can consider that brewery companies are incurring inventory cost in their supply chain.

The researcher has asked the brewery managers seeking to know the actions taken to cut the cost of goods sold. Company A manager replied *“for items procured in the country, the brewery prefers ordering big amount at once to get the advantage of discounts”*. Whereas company B manager replied *“the company did have long term contract agreement with its suppliers which it will be reviewed periodically”*. According to the manager of the company B, while they did the periodic reviews, there is an access to get lower price as of the review time.

On the other hand, both companies made a contract with their suppliers. According to the interview data collected from suppliers, the manager said *“a company which pays full amount in advance before the delivery of the product will not be treated as of the company which pays half*

in advance and half after the delivery of the product”. She said that “it is deadly sure that we give price discount for those who paid full advance payment.”

While having contracts with 3PL, both breweries have a win- win contract between them. Whenever there exists a decrease in demand of the product like in fasting and summer seasons, it is up to the brewery to decide and decrease the amount of trucks supplied from 3PL. When the demand of the beer increases, up on the request of the breweries, trucks will be added. This can avoid the demurrage cost which the breweries will be forced to pay for trucks stoppage at the brewery.

Asset Management performance of the supply chain

The supply chain assets of the brewery are inventory materials, warehouses, trucks, forklifts and working capital. According to the interview data collected from brewery managers, these assets are held efficient with a maximum effort of both companies. In both breweries, cash is received immediately when the products are sold to its distributors. In addition, there is no credit system for distributors which could take longer time to receive the accounts receivable of breweries.

As summarized in the reliability section of the interview, company B manager said *“the brewery is efficiently using the plant warehouse as well as the regional warehouses. All warehouses of the brewery are used to build stock for six and more sales days of the respective area distributors. This enables the brewery to be fair responsive and visible to the market.”* With related to the capital return of the breweries, both company managers said that there is high capital return of the supply chain fixed assets.

4.4.2 Suppliers Qualitative Data Analysis

Responsiveness of suppliers

The researcher has undertaken interview with five common suppliers of both breweries. These suppliers of the breweries are two chemical and consulting service suppliers (Eyureka Industrial Suppliers PLC and YANET Trading), Universal Plastic Factory, Addis Ababa Bottle and Glass Factory and Crown Cork Manufacturing PLC. These suppliers have long term contractual agreements with both breweries through delivering their products and/ or services. They also have been working more than seven years in Ethiopia, and also with both breweries.

The researcher asked these suppliers with the semi-structured questionnaire. One of the questions presented to the suppliers was *“how you measure the sourcing cycle time of the brewery and also the receiving cycle time at their site?”* Most of the suppliers replied *“the sourcing time from quotation collection to approval for contract is short”*. Both breweries did have long term contractual agreement with all of the suppliers. So that, in case where there needs to update the contracts, the suppliers will deal with the breweries and it will be renewed.

According to the interview data with the supplier managers of Addis Bottle and Glass Factory, and Universal Plastic Factory, both breweries contract is to transport the sourced items by breweries themselves. Due to this, both suppliers didn't know about the receiving cycle time of the breweries. Other suppliers said that most of the time, the receiving cycle time is medium. The delivery trucks will wait until the quality test is made, and/ or sometimes waiting for casuals who will offload from trucks.

The researcher also asked the suppliers about the payment systems of the brewery companies. The suppliers replied *“it is based up on the contractual agreement.”* In addition, most of the suppliers said that Company A pays 100% in advance for sourced items and company B pays half in advance. They added that, *“after the delivery of the procured items, company B takes a minimum of a week to approve the rest payment”*.

Reliability of suppliers

While the suppliers are asked about their reliability, most of the suppliers said that as they could deliver the right item, quantity, quality on the commit date with supporting documentation. According to Universal Plastic Factory manager, *“there was some deviation from the commit (contract) date, but now our company installed new machines and delivering the sourced items on their commit date”*.

According to Addis Bottle and Glass Factory manager, sometimes the company delivers sourced items lately due to repeated interruption of electric power. This interruption not only lead to late delivery of products but also to cost the company more since the raw materials in work- in-progress will be wastage. After interruption, the time to start production by itself takes time because the wastage needs to be removed from the area of production. In addition, all suppliers agreed that they are willing to receive for product return from both breweries.

Agility of suppliers

The researcher has also asked the brewery suppliers “*the capacity of unplanned 20% sustainable increase in quantity produced (supplied) to both breweries and how long they will take to deliver?*” Both managers of the chemical suppliers replied that all chemicals are imported from abroad (Belgium and USA). They said “*it is impossible to increase the unplanned sustainable quantity supplied to the breweries*”.

Both company managers replied “*when breweries need unplanned sustainable increase in chemicals, it might take not less than 3 months to bring from abroad*”. They added that “*it will be the shortest time*”. As the interview data shows, the challenge that prohibits these suppliers from building stock is shortage of foreign exchange.

On the other hand, the managers of Crown Cork Manufacturing Plc and Universal Plastic Factory said “*it is possible to increase the unplanned sustainable increase in quantity for the breweries.*” They added that their companies can start supplying the unplanned increase in quantity with in short period of time, may be, less than a week.

On the other hand, Addis Bottle and Glass Factory manager replied since the company is producing at its full capacity “*it is impossible to increase the unplanned sustainable increase in quantity for the breweries.*” She also said that “*in order to supply the unplanned sustainable increase in demand for the breweries, there shall be made an expansion phase, which will take more than two years.*”

4.4.3 Distributors Qualitative Data Analysis

Reliability of the Brewery at Customers point of View

In order to check the performance of the supply chain, the researcher has also undertaken a semi-structured interview with four distributors (two from each brewery). According to Company A distributors, “*the brewery delivers the ordered brands with correct documentation on the commit date*”. Company A distributors indicate that “*product shortage will happen during the peak season where the weather condition of the country becomes hot. At these times the brewery didn't honor the commit date.*”

Whereas company B distributors take their orders from the nearest brewery warehouses by themselves, they will receive by checking the items (brands) and quantity. The brewery also has a full product stock for more than six days at its regional warehouses. These warehouses assist the distributors to have the access of getting delivered their orders on the commit date.

Responsiveness of the Brewery at Customers point of View

The researcher asked distributors of the brewery as how long it takes to offload empty containers and load full goods on the distributor's trucks. Company A distributors said that while offloading and loading on Isuzu trucks, the brewery takes about 45 minutes since most of the work is done by casuals. The distributors of company B replied "*while we load products in pallets, it takes about 15 minutes but with a lot of hours waiting for a queue.*"

Agility of the Brewery at Customers point of View

According to the interview data collected from distributors, company A distributors said that the brewery is less adaptable in days to achieve an unplanned sustainable increase in quantity delivered. Whereas company B is adaptable in days to achieve an unplanned sustainable increase in quantity delivered for customers.

CHAPTER FIVE

Summary, Recommendation and Conclusion

5.1 Summary of Findings

Based up on the presentation of the results in the previous chapter, the findings of the study are summarized in this chapter. Using SCOR model as a supply chain performance measurement, the researcher measures the performance of two case breweries geographically located in Ethiopia.

According to the quantitative and qualitative data analysis, both companies supply chain are found reliable to their distributors. Even though, both companies supply chain is reliable, quantitatively, company A is more reliable (91% mode score) than company B (66.6% mode score). According to the analysis of the interview data, there are times where the breweries failed to honor the commit date, particularly during hot weather conditions.

With regard to responsiveness, company B's supply chain is found that in best performance, which scored a mode score of 5 (100% performance) for most of responsiveness performance metrics. But, Company B's performance found in advanced performance scoring a mode of 4 (80%) for its most responsiveness performance metrics. According to the interview data, company B's supply chain has warehouse for the distribution of its products which are found near to its distributors. This assists the supply chain of company B to be more responsive than company A.

In terms of agility performance of the supply chain, 70% of the performance metrics of company A scored a mode score of 3 and 2, which is poor performance. Whereas company B's supply chain is at advanced performance while scoring a mode score of 4 for its 40% responsiveness performance metrics. In addition, the interview data showed that both breweries supply chain are flexible in terms of days to deliver the unplanned sustainable increase in customers demand.

As the quantitative data clearly shows, both supply chains scored poor performance in supply chain costs performance metrics. Company B's supply chain has an additional cost incurred for its warehouses both at plant and regional areas.

50% of asset management performance metrics of company A showed that, it is best performing in asset management. Whereas 50% of asset management of company B is performing advanced performance.

According to the interview data collected from common suppliers of both breweries, except some unconditional challenges faced them like interruption of power and lack of foreign exchange, almost all of them are reliable to both breweries. Universal Plastic Factory is ready for the market change which comes from its customers. Addis Bottle and Glass Factory with limited capacity couldn't be flexible and adaptable.

5.2 Conclusion

- ✚ Both breweries supply chains are found in the research study best in reliability performance of the supply chain. Breweries have limitations to deliver on the commit date to its customers during the peak seasons (hot weather). Addis Glass Factory has a limitation of delivering the ordered items on the commit date, which its challenge comes from an interruption of power.
- ✚ Company A is an advanced performance in source cycle time whereas company B is best performing. On the other hand, both companies are in advanced performance for make cycle time of their supply chain. But, company B is best performing in delivery cycle time which comes from its warehouse management when company A is in advanced management. To conclude, company B's responsiveness performance is best while company A's in advanced performance.
- ✚ Both breweries supply chain are less flexible in upside supply chain flexibility. Company A also less adaptable in upside supply chain adaptability whereas company B is more adaptable in upside supply chain adaptability. The overall value at risk of the supply chain actors of both breweries are in best performance.
- ✚ Even though, both companies deployed different techniques to cut the cost of the company, both of them scoring poor performance in their supply chain cost. Company A tried to minimize the cost through full advance payment and bulk sourcing, while company B tries to decrease in periodic reviews of the contracts.
- ✚ Company A is in best performance in asset management while company B is in advanced performance. In company A, there is no capital tie up due to full goods stock

and there is no warehousing cost as well. On contrary, company B has a capital tie up for the stored amount of products in its distribution warehouses and the warehousing cost by itself. Both companies are best performers in cash to cash flow, because breweries are collecting cash immediately for the sold product amount.

5.3 Recommendation

As the research findings showed both companies are best performing in reliability performance of their respective supply chain. But, company A shall focus on working to deliver the ordered items and meet the commit date accurately.

Company A is in an advanced performance in responsiveness of the supply chain while company B is best performer in this variable. Company A does not have warehouse for its full goods produced in the brewery as well as in the regional sales area. Company A directly sales the amount produced on the daily basis. As the research study shows that, there are times where the company will stop producing since there are unexpected emergency which are not controllable by the company, like electric power interruption. So that, the researcher recommends company A to have warehouse at least in the plant to have full goods stock for some days sales, which can be used for contingencies.

As the study prevails that most suppliers are excited for full advance payment and even some of them make discount for such buyers. The researcher recommends company B to pay full payment for its suppliers in order to have good relationship and get the advantage of price discount from suppliers.

Both breweries take from two to four hours to load/offload a truck in their warehouses, even there are waiting queue in company B. From this, the researcher advised both breweries to minimize the time lost during loading and offloading through paying incentives for casuals and forklift operators who are operating in loading and offloading activities.

Undertaking periodic review of supplier's performance could assist companies to have good quality product and get the updated price for the supply chain as a whole. Company A didn't have such a culture with this regard. The researcher recommends company A to undertake periodic review in order to get latest price from market and decrease the cost of the supply chain.

The brewery market is quite predictable, it is known that when the demand will reach peak and the vice versa. According to the study, both breweries incurred high supply chain cost. The researcher recommends company B to source materials (packaging, raw, chemicals, crate and bottle) in bulk.

According to the study findings, both breweries did not have a practice of measuring their supply chain performance. Both breweries also didn't clearly put in which performance attributes to score poor, advanced and best. According to SLG (2014), companies need to ask themselves in which performance attributes to excel and succeed in the market. The researcher recommends these breweries to give focus for periodic supply chain performance measurement. By doing so, they can score better supply chain performance and then use it as a competitive advantage over their competitors.

According to the research study, company B has medium length of inventory materials, finished goods and purchase of materials to cash payments as well. Company B shall have a good planning system which could enable the company efficient as possible.

The research study depicts that both brewery supply chains are not flexible and adoptable for market changes. The breweries are using their maximum capacity of production. Almost all suppliers of the breweries take long time to produce (import the sourced) items. Due to this, both breweries supply chain needs very long time and very low capacity to increase the quantity produced/ supplied. The researcher recommends both brewery supply chains to be more planned through material requirement planning. The breweries better increase their capacity of production. Addis Ababa bottle and Glass factory shall have an expansion plan in order to be agile for its supply chain.

5.4 Limitation of the study

As many research works have limitations, this research study is also subject to some limitations. The research work does not include all supply chain actors from supplier's supplier to customer's customer. It gives concern to suppliers, breweries and distributors (customers). In order to measure the full supply chain performance, future studies shall consider all actors in their studies.

Due to resource limitation, the research study could not incorporate all the brewery companies in Ethiopia. Study shall be undertaken as a comprehensive study which could show the aggregate performance of breweries in Ethiopia. The research work also done with subjective measures rather than with an objective measures. Practitioners shall give emphasis on doing research works through objective measures so that the performance of the supply chain in breweries shall be measured in terms of days and money, like the days which takes deliveries to a customer, the length of days of raw materials and cost of delivering an item in money.

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APPENDICES

ADDIS ABABA UNIVERSITY

SCHOOL OF COMMERCE

Masters of Arts in Logistics and Supply Chain Management

Title: Examining the Supply Chain Performance of Selected Breweries
in Ethiopia, using SCOR Model

Dear Respondent,

I am undertaking a master's thesis on the title "Examining the supply chain performance in selected breweries of Ethiopia using SCOR model" as a partial fulfillment of requirement for Masters of Arts in Logistics and Supply Chain Management.

I do believe that your response and participation in the survey questionnaire is a great input to the research study. So that, I kindly requests you to participate and answer all the questions.

The purpose of the questionnaire is fully for academic (will not be used for any other purposes). Your responses will be kept confidential and will not be traceable to the individual respondents. Please be informed that it is not necessary to write your name and the company as well.

Completing the questionnaire will take about 25 minutes. I kindly ask you to spare a few minutes from your busy schedule since your participation is valuable for the success of the study.

Finally, I thank you very much! Your efforts are greatly appreciated!!!

Don't hesitate to contact me as necessary in the addresses.

Yaregal Lakew

Master's Degree Program Candidate

Email: yarccs05@gmail.com

Appendix-A

Self-administered Questionnaire

Questionnaire for Brewery Respondents

SECTION-1: RESPONDANT'S PROFILE

The following questions are about the respondents profile in the organization. Kindly indicate the appropriate characteristics of the respondent's profile using (√) on the check box.

1. ID of Respondent _____

2. Respondent's Gender

Male Female

3. Age of Respondent

under 25 years

From 30 to 40 years

From 25 to 30 years

Above 40 years

4. Level of education

College Diploma

MA/MBA/MSc

BA/BSc Degree

PhD and above

5. Respondent's work experience

Below 2 years

5 - 10 years

2 - 5 years

More than 10 years

6. Respondent's current position in the company

Commercial Manager

Distribution Manager

Supply Chain Manager

Planning Manager

Sales and Marketing Manager
bound Planner

Planning Officer/ In/Out-

- | | |
|---|---|
| <input type="checkbox"/> Deputy Marketing Manager | <input type="checkbox"/> Sourcing Manager |
| <input type="checkbox"/> Production Manager | <input type="checkbox"/> Procurement Manager |
| <input type="checkbox"/> Deputy Production Manager | <input type="checkbox"/> Import Manager |
| <input type="checkbox"/> Transport Manager | <input type="checkbox"/> Supply Chain Director |
| <input type="checkbox"/> Warehouse Manager | <input type="checkbox"/> Plant Director |
| <input type="checkbox"/> Warehouse Supervisor/ Team Leader
Team Leader | <input type="checkbox"/> Packaging Section Head / |
| <input type="checkbox"/> Brewing Supervisor/ Team Leader
specify_____ | <input type="checkbox"/> Any other, |

SECTION 2: PERFORMANCE OF SUPPLY CHAIN MANAGEMENT PRACTICES

The following questions are about how your organization is implementing supply chain activities. Please indicate the level of your agreement or disagreement by encircling on the number for the following statements based on your experience in your company. The rating is from 1= Strongly Disagree to 5=Strongly Agree, as shown below.

3.1 SUPPLY CHAIN RELIABILITY (RL)						
SCOR Code	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
RL.2.1 Perfect Order Fulfillment						
RL.3.33	The brewery/ supplier delivers the ordered item accurately	1	2	3	4	5
RL.3.35	The brewery/ supplier delivers the ordered quantity accurately	1	2	3	4	5
RL.2.2 Percentage of orders delivered in full						
RL.3.32	The brewery/ supplier achieves the commit date to its customers	1	2	3	4	5
RL.3.34	The brewery delivers the order to the correct location and customer	1	2	3	4	5
RL.2.3 Documentation Accuracy						

RL.3.31	The suppliers complete, correct, and readily available compliance documentations (Material Safety Data Sheet and Certificate of Analysis) accurately	1	2	3	4	5
RL.3.43	The suppliers complete, correct, and readily available required documentations (quality certificate)	1	2	3	4	5
RL.3.45	The suppliers complete, correct, and readily available payment documentations (invoice document and contractual agreement)	1	2	3	4	5
RL.3.50	The suppliers complete, correct, and readily available shipping documentations (shipment note, bill of loading and packing list)	1	2	3	4	5
RL.3.50	The brewery complete, correct, and readily available shipping documentations (shipment note, bill of loading and packing list)	1	2	3	4	5
RL.2.4 Perfect Condition						
RL.3.24	The brewery/supplier deliver breakage free products	1	2	3	4	5
RL.3.42	The brewery/supplier delivers defect (Under fill) free products	1	2	3	4	5
RL.3.55	The commitment of the brewery/supplier to returns of its products	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the check box for the following statements based on your experience in your company. The rating is from 1= Very Long to 5=Very Short, as shown below.

3.2 SUPPLY CHAIN RESPONSIVENESS (RS)						
SCOR Code		Very long	Long	Medium	Short	Very Short
RS.3.107	RS.2.1 Source Cycle Time The material receiving cycle time of the brewery (supplier's truck reaching the plant to issue Goods Receiving Note)	1	2	3	4	5
RS.3.140	The material quality verification cycle time of the brewery (from reporting to quality department to approval of reject/ accept)	1	2	3	4	5
RS.3.8	The authorize supplier payment cycle time of the brewery (from request to effect payment to the suppliers)	1	2	3	4	5
RS.2.2 Make Cycle Time						
RS.3.123	Schedule production activities cycle time of the brewery	1	2	3	4	5
RS.3.49	Issue raw materials cycle time of the brewery	1	2	3	4	5

RS.3.101	Brewing and quality test cycle time of the brewery	1	2	3	4	5
RS.3.142	Beer packaging cycle time of the brewery (according to the standard of the company)	1	2	3	4	5
RS.3.114	Release finished product to warehouse cycle time of the brewery	1	2	3	4	5
RS.2.3 Deliver Cycle Time						
RS.3.116	The average time for reserving resources and determining a delivery date	1	2	3	4	5
RS.3.18	The average time required for customer order consolidation	1	2	3	4	5
RS.1.124	The average time required for selecting the type of the trucks	1	2	3	4	5
RS.3.51	The average time associated with product loading of trucks	1	2	3	4	5
RS.3.51	The average time associated with generation of shipment documents	1	2	3	4	5
RS.3.126	The average time required for shipping orders	1	2	3	4	5
RS.3.102	The average time required for receiving and verifying an order at customer site	1	2	3	4	5
3.3 SUPPLY CHAIN AGILITY (AG)						
AG.1.1 Upside Supply Chain Flexibility						
AG.2.1	The number of days required to achieve an unplanned sustainable increase in quantity of raw materials	1	2	3	4	5
AG.2.2	The number of days required to achieve an unplanned sustainable increase in production with the assumption of no raw material constraints	1	2	3	4	5
AG.2.3	The number of days required to achieve an unplanned sustainable increase in quantity delivered with the assumption of no product constraint	1	2	3	4	5
AG.2.5	The number of days required to achieve an unplanned sustainable increase in the return of finished goods from customers	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the check box for the following statements based on your experience in your company. The rating is from 1= Very Low to 5=Very High, as shown below.

AG.1.2 Upside Supply Chain Adaptability
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SCOR Code	Statements	Very Low	Low	Medium	High	Very High
AG.2.6	The maximum sustainable increase in raw material quantity that can be acquired (received)	1	2	3	4	5
AG.2.7	The maximum sustainable increase in production quantity that can be achieved with the assumption of no raw material constraints	1	2	3	4	5
AG.2.8	The maximum sustainable increase in quantity delivered that can be achieved with the assumption of unconstrained finished good availability	1	2	3	4	5
AG.2.10	The sustainability of the brewery for an increase in finished goods returned from customers	1	2	3	4	5
AG.1.4 Overall Value at Risk						
SCOR Code	Statements	Very High	High	Medium	Low	Very Low
AG.2.14	The value at risk of the supply chain actors which can cause a process failure or disruption	1	2	3	4	5
AG.2.15	The probability of external risk event like hurricane, earthquake, political instability, etc in the supply chain of the brewery	1	2	3	4	5
3.4 SUPPLY CHAIN MANAGEMENT COST (CO)						
SCOR Code	CO.1.001 Total Cost to Serve	Very high	High	Medium	Low	Very Low
CO.2.001	The total cost of personnel, automation, assets and overhead associated with supply chain planning processes	1	2	3	4	5
CO.2.002	The total cost associated with managing order, receiving, inspection and warehousing of materials from supplier	1	2	3	4	5
CO.2.003	The material landed cost (actual price and expense paid) of location of use for packaging and raw materials	1	2	3	4	5
CO.2.004	The total cost associated with managing and performing production processes	1	2	3	4	5
CO.2.005	The total cost associated with receiving an order, scheduling transport, order tracking and tracing, invoicing to customer	1	2	3	4	5

CO.2.006	The fulfillment cost of an order to the customer (distribution centers and transportation costs)	1	2	3	4	5
CO.2.007	Cost of imperfect delivery to customer (defective, excess and returns)	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the check box for the following statements based on your experience in your company. The rating is from 1= Very Long to 5=Very Short, as shown below.

ASSET MANAGEMENT EFFICIENCY (AM)						
SCOR Code		Very long	Long	Medium	Short	Very Short
	AM.1.1 Cash-to-cash Cycle Time					
AM.2.1	The length of time from sale is made to cash received from customers	1	2	3	4	5
AM.3.16	The length of inventory days of raw materials	1	2	3	4	5
AM.3.45	The length of inventory days of finished goods	1	2	3	4	5
AM.2.3	The length of time from purchase of raw materials to cash payments	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the check box for the following statements based on your experience in your company. The rating is from 1= Very Low to 5=Very High, as shown below.

SCOR Code		Very Low	Low	Medium	High	Very High
	AM.1.2 Return on Supply Chain Fixed Asset					
AM.1.2	The return an organization receives from capital investment in supply chain fixed assets	1	2	3	4	5
AM.1.3	Revenue generated relative to working capital invested on supply chain	1	2	3	4	5

Questionnaire for Brewery Suppliers

SECTION-1: RESPONDANT'S PROFILE

The following questions are about the respondents profile in the organization. Kindly indicate the appropriate characteristics of the respondent's profile using (√) on the check box.

1	Gender	<input type="checkbox"/> Male <input type="checkbox"/> Female	
2	Age	<input type="checkbox"/> under 25 years <input type="checkbox"/> From 30 to 40 years <input type="checkbox"/> From 25 to 30 years <input type="checkbox"/> Above 40 years	
3	Level of education	<input type="checkbox"/> College Diploma <input type="checkbox"/> MA/MBA/MSc <input type="checkbox"/> BA/BSc Degree <input type="checkbox"/> PhD and above	
4	Respondent's work experience	<input type="checkbox"/> Below 2 years <input type="checkbox"/> 5 - 10 years <input type="checkbox"/> 2 - 5 years <input type="checkbox"/> More than 10 years	
5	Respondent's current position in the company	<input type="checkbox"/> Commercial Manager <input type="checkbox"/> Distribution Manager <input type="checkbox"/> Supply Chain Manager <input type="checkbox"/> Planning Manager <input type="checkbox"/> Marketing Manager <input type="checkbox"/> Procurement Manager <input type="checkbox"/> Transport Manager <input type="checkbox"/> Import Manager <input type="checkbox"/> Warehouse Manager <input type="checkbox"/> General Manager <input type="checkbox"/> Warehouse Supervisor/ Team Leader <input type="checkbox"/> Any other, specify _____	

SECTION 2: PERFORMANCE OF SUPPLY CHAIN MANAGEMENT PRACTICES

The following questions are about how your organization is implementing supply chain activities. Please indicate the level of your agreement or disagreement by encircling on the numbers for the following statements based on your experience in your company. The rating is from 1= Strongly Disagree to 5=Strongly Agree, as shown below.

	SCOR Code	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
6	RL.3.31	The supplier complete, correct, and readily available compliance documentations (Material Safety Data Sheet and Certificate of Analysis) accurately	1	2	3	4	5
7	RL.3.43	The supplier complete, correct, and readily available required documentations (quality certificate)	1	2	3	4	5
8	RL.3.45	The supplier complete, correct, and readily available payment documentations (invoice document and contractual agreement)	1	2	3	4	5
9	RL.3.50	The supplier complete, correct, and readily available shipping documentations (shipment note and packing list)	1	2	3	4	5
10	RL.3.24	The supplier deliver breakage free products	1	2	3	4	5
11	RL.3.42	The supplier delivers defect free products	1	2	3	4	5
12	RL.3.55	The commitment of the supplier to returns its products	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the numbers for the following statements based on your experience in your company. The rating is from 1= Very Long to 5=Very Short, as shown below.

	SCOR Code	RS.2.1 Source Cycle Time	Very long	Long	Medium	Short	Very Short
13	RS.3.107	The raw material receiving product cycle time of the brewery	1	2	3	4	5
14	RS.3.140	The raw material verification of product cycle time of the brewery	1	2	3	4	5
15	RS.3.8	The authorize supplier payment cycle time of the brewery	1	2	3	4	5
16	AG.2.1	The number of days required to achieve an unplanned sustainable increase in quantity of raw materials	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the numbers for the following statements based on your experience in your company. The rating is from 1= Very Low to 5=Very High, as shown below.

	SCOR Code	Statements	Very Low	Low	Medium	High	Very High
17	AG.2.6	The maximum sustainable increase in raw material quantity that can be delivered	1	2	3	4	5

Questionnaire for Brewery Distributors

SECTION-1: RESPONDANT'S PROFILE

The following questions are about the respondents profile in the organization. Kindly indicate the appropriate characteristics of the respondent's profile using (√) on the check box.

1	Gender <input type="checkbox"/> Male <input type="checkbox"/> Female
2	Age <input type="checkbox"/> under 25 years <input type="checkbox"/> From 30 to 40 years <input type="checkbox"/> From 25 to 30 years <input type="checkbox"/> Above 40 years
3	Level of education <input type="checkbox"/> College Diploma <input type="checkbox"/> MA/MBA/MSc <input type="checkbox"/> BA/BSc Degree <input type="checkbox"/> PhD and above
4	Respondent's work experience <input type="checkbox"/> Below 2 years <input type="checkbox"/> 5 - 10 years <input type="checkbox"/> 2 - 5 years <input type="checkbox"/> More than 10 years
5	Respondent's current position in the company

<input type="checkbox"/> General Manager <input type="checkbox"/> Sales Manager <input type="checkbox"/> Warehouse Manager <input type="checkbox"/> Warehouse Supervisor/ Team Leader	<input type="checkbox"/> Distribution Manager <input type="checkbox"/> Any other, specify _____
--	---

SECTION 2: PERFORMANCE OF SUPPLY CHAIN MANAGEMENT PRACTICES

The following questions are about how your organization is implementing supply chain activities. Please indicate the level of your agreement or disagreement by encircling on the check box for the following statements based on your experience in your company. The rating is from 1= Strongly Disagree to 5=Strongly Agree, as shown below.

SCOR Code	Statements	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
6	RL.3.33	The brewery delivers the ordered item accurately	1	2	3	4	5
7	RL.3.35	The brewery delivers the ordered quantity accurately	1	2	3	4	5
8	RL.3.32	The brewery achieves the commit date to its customers	1	2	3	4	5
9	RL.3.34	The brewery delivers the order to the correct location and customer	1	2	3	4	5
10	RL.3.45	The brewery complete, correct, and readily available payment documentations (invoice document)	1	2	3	4	5
11	RL.3.50	The brewery complete, correct, and readily available shipping documentations (shipment note)	1	2	3	4	5
12	RL.3.24	The brewery deliver breakage free products	1	2	3	4	5
13	RL.3.42	The brewery delivers defect (Under fill) free products	1	2	3	4	5
14	RL.3.55	The commitment of the brewery to returns its products	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the check box for the following statements based on your experience in your company. The rating is from 1= Very Long to 5=Very Short, as shown below.

	SCOR Code	Statements	Very long	Long	Medium	Short	Very Short
15	RS.3.51	The average time required for product loading and generation of shipment documents	1	2	3	4	5
16	RS.3.126	The average time required for shipping orders	1	2	3	4	5
17	RS.3.102	The average time required for receiving and verifying an order at customer site	1	2	3	4	5
18	AG.2.3	The number of days required to achieve an unplanned sustainable increase in quantity delivered with the assumption of no other constraints	1	2	3	4	5

Please indicate the level of your agreement or disagreement by encircling on the check box for the following statements based on your experience in your company. The rating is from 1= Very Low to 5=Very High, as shown below.

	Statements	Very Low	Low	Medium	High	Very High
19	AG.2.8 The maximum sustainable increase in quantity delivered that can be achieved with the assumption of unconstrained finished good availability	1	2	3	4	5

Appendix-B

Semi-structured Interview Questions

Interview Questions to Case Brewery Company Managers

I. Warehouse/ Logistics Managers

Please explain the following complementary semi structured questions.

1. Please tell me about yourself, your position and your company?
2. Did the company measure the performance of its supply chain? What kind of measurement tool it uses? How is its achievement in percentage?
3. Does the company trucks are enough to distribute its products? Did the company use rental trucks in line with its own trucks?
4. How many days required to achieve unplanned sustainable increase in quantity delivered with the assumption of no product constraint?
5. Is there any standard time set for loading/ offloading of a truck in the brewery?
6. Do you think that the brewery is reliable to its customers?
7. Do you have ever seen shortage of products while there were customer orders? If yes, what plans are set to solve consistently?
8. For how many days the brewery builds full goods stock? What about the warehouse space constraint?
9. Have you recognized a refusal of customer delivery? What was the reason?
10. What type of documents the company uses to issue its products? Manual or/and system documents?
11. What do you think about the responsiveness of the brewery to its customers?
12. How much the brewery could increase its production capacity under the current status?
13. How many days required to achieve a 20% unplanned sustainable increase in production?

II. Planning (Procurement) Managers

Please explain the following complementary semi structured questions.

1. Please tell me about yourself, your position and your company?

2. For how many days/months the brewery make stock of raw materials?
3. Did suppliers willing to increase a 20% unplanned sustainable increase of sourced items?
4. Did the suppliers are responsive to the brewery?
5. Do you think that the brewery is utilizing the supply chain assets efficiently?
6. Do you think that the supply chain is delivering its products with least cost possible to its customers? Is there any standard set to the supply chain cost? Is there any efforts made to decrease the cost of the supply chain? What?
7. Did the suppliers of the brewery reliable to the brewery? If yes, how?

III. Interview Questions to Brewery Distributors

Please Explain the following complementary semi structured questions.

1. Please tell me about yourself, your position and your company?
2. How many years it operates? How many years it works with the brewery?
3. Did the brewery deliver the ordered item (brand) with correct documentation?
4. Did you receive your orders on the commit date?
5. How many hours it takes to offload and load a truck with trailer (2400 crates)?
6. What do you think about the flexibility of the brewery to the market changes?

IV. Interview Questions to Brewery Suppliers

Please explain the following complementary semi-structured questions.

1. Please tell me about yourself, your position and your company?
2. How many years it operates? How many years it works with the brewery?
3. Did you think that the brewery's source cycle time short (from collection of quotation to selection of the supplier)?
4. Did the brewery's materials receiving cycle is short? How long will it takes?
5. Did your company deliver the sourced items on the commit date?
6. Did your company deliver the sourced items with full documentations?
7. Did the brewery authorize the payment for delivered items in short time? How long it takes?