Supply Chain Performance Assessment of Brewery Industry: The case of Heineken Brewery

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Declaration

I Eyob Fekadie hereby declare that this thesis titled. "*SUPPLY CHAIN PERFORMANCE ASSESSMENT OF BREWERY INDUSTRY: THE CASE OF HEINEKEN BREWERY":* I have carried out the present study independently with the guidance and support of the research advisor, Shiferaw Mitiku (PhD) any other research or academic sources used here in this, study have has not been submitted for the award of any degree or diploma program in this or any other institution.

Declared by

Eyob Fekadie _____ _____

Signature Date

Confirmation by Advisor

Shiferaw Mitiku (PhD) _____ _____

Signature Date

CERTIFICATION

This is to certify that EYOB FEKADIE has carried out his research work on the topic entitled, *"SUPPLY CHAIN PERFORMANCE ASSESSMENT OF BREWERY INDUSTRY: THE CASE OF HEINEKEN BREWERY"* the work is original in nature and is suitable for submission for the award of master degree in logistics & supply chain management

Advisor

Name: Shiferaw Mitiku (PhD)

Signature: _____

Date: _____

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LIST OF ABBREVIATIONS/ ACRONYMS

AMF: Assela Malt factory B2B: Business to Business

EDI: Electronic Data Interchange system

ERP: Enterprise Recourse Planning

ICT: Information and Communication Technology SCM: Supply Chain Management

SCOR: Supply Chain Operation Reference Model

VMI: Vender Managed Inventory.

SPSS: Statistical Packages for Social Science

Abstract

In this thesis, the researcher assessed the perceived performance of supply chain in the case of Heineken brewery companies in Addis Ababa. The study focused on seven supply chain performance variables, integration with suppliers, integration with customers, supply chain reliability, supply chain responsiveness, supply chain agility, supply chain operational cost and inventory management Practice. The main objective of this paper is to get in-depth insight about the supply chain performance of Sales outlet in the case of Heineken brewery. The research strategy of this study is a multiple case study and the brewery companies were the unit of analysis. Moreover, the study included first tier local strategic suppliers and their first and second tier customers of the case breweries to ensure the reliability of the research output. The research design applied was mixed approach. The quantitative data was analyzed using SPSS for descriptive statistics and the qualitative data was used to further explain the findings of the quantitative data. The finding of the study indicates that the downward supply chain is more reliable and flexible than the upstream supply chain. The supply chain operation of the case of Heineken breweries was perceived high. The study also found the gap related to joint planning, forecasting and sharing of supply chain information of the case breweries with their suppliers and customers. This study also identified gaps in managing supply chain inventories in relation to visibility of the inventory status along the supply chain.

In conclusion, the Heineken breweries focus on responsiveness and reliability with high operational cost. The case brewery companies collaborate with their chain partners only on limited areas. The level of trust is also minimal due to high completion with rivalries. Consequently, long term demand forecast or sales forecast are very rarely shared with channel partners. The inventory management practice also shows potential risk of holding overstock or under stock due to lack of using standard inventory management tools consistently. The upstream supply chain is less reliable and flexible due to limited local suppliers' capacity as well as long import process than the downward supply chain and that the supply chain operational cost along the chain was considered high.

***Keywords**: Supply Chain management performance in the case of Heineken brewery companies.*

Table of Contents

Contents **page**

List of Figures

List of Tables

CHAPTER ONE

INTRODUCTION

This chapter will present background information, statement of the problem, research questions and objectives of the research with regard to the topic. It will also deal with the significance and scope of the study, among others. In addition, it provides brief information as to how the whole thesis would be organized in the end.

1.1. Background of the study

Any organization can get a competitive advantage over its competitors through effective and efficient supply chain management. Supply chain management is the basis for all business organizations to compete with each other. It also means supply chain management enables companies even to survive through supply chain effectiveness and efficiency (Hassini, 2008). Supply chain performances include information sharing, facilities management, transportation, sourcing, distribution and linkages with partners. For a company to perform effectively, it must adopt the ways of information distribution, management of facilities such as logistics, transportation and warehousing. To improve the overall performance of supply chain, the members of supply chain may behave as a part of a unified system and coordinate with each other (Richey, *et al*., 2009).

Organizations used to perceive customers, suppliers and other supply chain actors as independent entities in their business process rather than considering them as an integral part of their business as well as their decisive business partner. In the modern business world, competition is no longer between organizations, but among supply chains (Trkman*et al*., 2010). Companies must compete against one another in order to survive. As the global economy continues to grow, companies are no longer competing independently but rely on their supply chain systems. Business management has entered the era of inter-network competition. In this emerging competitive environment, the ultimate success of the single business will depend on management's ability to integrate the company's intricate network of business relationships with different supply chain actors. Strictly speaking, the supply chain is not a chain of businesses with one-to-one, business-to-business relationships, but a network of businesses and relationships.

Supply chain management offers the opportunity to capture the synergy of intra - company and inter-company integration and management. In that sense, supply chain management deals with total business process excellence and represents a new way of managing the business and relationships with other members of the supply chain (Cooper *et al*., 1997). Effective supply chain management (SCM) has therefore become a potentially valuable way of securing a competitive advantage and improving organizational performance (Li *et al*., 2006). Efficient supply chain management is indispensable for a company to survive and is a competitive weapon with rivalry companies.

Supply Chain Management is the systemic and strategic coordination of the traditional 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 that of the member of a given Supply Chain as a whole (Mentzer, 2001).

Efficient supply chain enables upstream and downstream supply chain firms to compete better. A customer focused supply chain strategy requires a total systems view of the linkages in the chain that work together efficiently to create customer satisfaction at the end point of delivery to the consumer. Consequently, costs must be lowered throughout the chain by driving out unnecessary costs, processes, shorten the delivery lead times and focusing on value adding supply chain processes (Mentzer and Gundlach , 2009). As per the aforementioned literatures, one can understand that supply chain integration, system thinking and performance have a significant impact onthe performance and competitiveness of companies. Consequently, the subject of this study is very attractive and under researched.

The brewery industry sector in Ethiopia has been growing well over the past recent years. As a result of which, the industry is attracting multinational business companies with different mode of entry. Consequently, the number of beer manufacturing companies increased in the last decade following the growing demand of beer in the country. As a result, the competition for these substitute products seems tough and aggressive promotional and marketing efforts are becoming high. Following the reports of international organizations like IMF and World Bank on the development and the fast economic growth of the country, direct foreign investment is increasing and the government of Ethiopia also opens up the beverage industry to foreign investors. As a result, the world's leading multinational companies such as BGI, Heineken, and

Diageo entered the brewery industry through acquisition of the state – owned breweries and building new ones with huge investment in the country. The brewery industry currently supplying for local consumption due to growing demand of beer in the country, but it has a great potential to expand its production and enter the export business. Some of them have been exporting beers. The state- of- the - art supply chain management plays irreplaceable role as a competitive weapon in such a highly competitive and growing brewery industry. Thus, managing the supply chain in the business environment has a major impact on performance of all parties involved in the chain.

Despite the role of supply chain management as a competitive tool, the supply chain operational excellence in the brewery in Ethiopia is under researched and there is knowledge gap how well is the performance supply chain management performance in Ethiopia. In this regard, this thesis focus on investigating the performance of supply chain management performance and challenges in the case of Heiniken brewery located in Akaki, Addis Ababa. With regard to collaboration and integration with suppliers and customers, supply chain reliability, responsiveness, flexibility and supply chain operational cost as well as ICT utilization in supply chain management in the brewery will be given consideration.

1.2. Statement of the problem

When I went to the Heineken Brewery and visit the overall performance activities on seals outlet performance measuring is done.

The measures taken for gauging different fixed and operational costs related to a supply chain performance are considered and measures.

Various related studies note that companies are now seeking to integrate their decisions across the supply chain performance partners globally as a result of increasing awareness about the financial and non – financial impact of supply chain performance processes on business companies in particular. In Heineken Brewery, the concept of supply chain performance for improvement is at the infant stage except very few multinational and international companies operating in the brewery. In connection with this, most researches on assessment of supply chain performance and related challenges were conducted on manufacturing companies in the industrialized countries and very few in developing countries, like Ethiopia.

In particular, the researchers conducted on the supply chain performance on brewery industry were very rare in Ethiopia in particular. As a result, there was little work about the performance of supply chain in the brewery industry particularly the younger Heineken operation in Ethiopia. This knowledge gap in the subject of this topic in this competitive industry convinced this researcher to a large extent to incline for conducting on this topic of research.

In general, there was less insight about the level of integration and collaboration with supply chain performance upstream and downstream partners, supply chain reliability, responsiveness, agility, cost effectiveness and inventory management efficiency as well as effectiveness, in the supply chain performance in the case of Heineken brewery.

The intention of this research study is to investigate and analyze the performance supply chain performance focusing on the level of supply chain integration and collaboration with the chain partners, the responsiveness, reliability, agility, and cost and inventory management efficiency and effectiveness of the supply chain performances as well as challenges.

1.3 Research Questions

The basic questions that this research is intended to address include the following:

- How reliable, responsive, flexibility or adaptability, and cost effectiveness is the supply chain management performance of Heineken brewery?
- How Asset management is being practiced at Heineken brewery?
- What is the level of integration and collaboration in the case of the brewery company with suppliers and customers?
- What are the major challenges for the supply chain management of the Heineken brewery?

1.4 Objective of the Study

1.4.1 General Objective of the Study

The general objective of this study is to investigate and measures the performance of supply chain management performances of the case brewery company located in Addis Ababa and identify gaps based on the literatures reviewed to get better insight about the supply chain operations in the case brewery company.

1.4.2 Specific Objectives of the Study

The specific objectives of this study are:

- To measure the supply chain reliability of the supply chain of Heineken brewery?
- To measure the responsiveness of the supply chain in Heineken brewery?
- To measure the flexibility (Agility) of the supply chain of Heineken brewery?
- To determine the cost effectiveness of the Heineken brewery?
- To measure Asset management of Heineken brewery?
- To measure the supply level of integration of the supply chain of Heineken brewery?
- To identify the major challenges of affecting the supply chain performance of Heineken brewery?

1.5 Significance of the Study

Doing a research in the supply chain management focusing on particular brewery company has a significant role for any manufacturing company in the brewery industry, provided that companies implement the supply chain management successfully. Effective and efficient supply chain management creates value to customer as well as the rest of the supply chain actors and enables the supply chain firms to maintain or gain competitive advantages over their competitors. Besides, in the contemporary business environment, individual firms will not perform and

compete independently. There is no more competition among individual firms, but it is among the supply chain network.

Thus, besides enabling the firm to plan improvement actions and to fill its gaps, conducting a research on supply chain performance and identifying gaps may provide useful information for the academia, policy makers, and contributes to the existing literature. The outcome of this study will enhance understanding about supply chain management performances in case brewery company in order to plan for improvement by the brewery company under study in particular. The finding will also give an insight to other supply chain partners (the suppliers, distributors, retail outlets, transporters, etc.) in the chain of the case brewery industry to scrutinize its own supply chain operational performance excellence.

1.6 Scope of the Study

The scope of this study is limited to the case brewery company which is located in Addis Ababa. The topical scope of the study would be limited to issues related to the supply chain performance of the brewery company under consideration. The supply chain variables collaboration and integration with strategic suppliers and customers, information technology utilization in SCM, supply chain reliabilities, responsiveness, agility, cost and inventory management performances including vendor managed inventory (VMI), collaborative forecasting, planning and replenishment. The other components of supply chain performance indicators like green supply chain, supply chain human resource, integration among the internal functions, the strategic alignment between the supply chain strategy and competitive strategy are out of the scope of this study.

1.7 LIMITATION OF THESTUDY

Just like any research study, this thesis also has the following limitations: Since this study is a multiple case study, it lacks external validity or generalizability of the findings to the rest of the brewery companies in the industry. The study focused only on limited supply chain performance variables mentioned above and there are other variables to measure the performance of supply chains like sustainable or green supply chains, strategic alignments, etc. are out of the scope of this study.

1.8. Organization of the study

Chapter one will be on the background of the study, problem statement and the most important objective of the study. On Chapter two, literature review of supply chain management performance and challenges done in connection with the study. Chapter three gives the description of the methodology to be used in the study, data collection means and way of study on Brewery Company under consideration. Chapter four presents the findings on data analysis and discussion related to the topic. Finally chapter five will be all about the summary, conclusions and recommendations.

CHAPTER TWO

Review of Related Literature

This Chapter will presents review of related literature, theoretical literature review &empirical literature review .It will also deal with supply chain strategy and performance as well as chain integration & collaboration. In addition to this supply chain coordination mechanism &conceptual framework study are discussed below.

In this chapter various issues of related literature would be treated under the categories of theoretical, empirical and conceptual frameworks. The chapter will focus on relevant literature and issues relevant for this study. Above all, it attempts to give an insight into the concept of Supply Chain Management, supply chain strategy, supply chain performance as well as supply chain integration and collaboration.

2.1. Theoretical Literature Review

2.1.1 Supply Chain Management

A Supply Chain is an interconnected set of relationships from customer to supplier, through a number of intermediate stages such as sourcing, manufacturing, and warehousing and distribution and it is a network of companies which influence each other (Agarwal& Shankar 2002). Therefore, a supply chain consists of three or more organizations or individuals that are directly involved in the upstream and downstream flow of demand information, cash, products and services (Mentzer, 2001). SCM is a set of approaches that efficiently integrate and coordinate the materials, information and financial flows across the supply chain so that merchandise is supplied, produced and distributed in the right quantities, to the right locations, and at the right time, in the most cost-efficient way, while satisfying customer requirements (Hugo, et.al, 2011).The objective of SCM is to achieve a sustainable competitive advantage (Handfield, *et al*., 2009).

Focus has been increased regarding the business relationships and more particularly when it comes to long-term collaboration between customers and suppliers in the supply chain and demand chain (Giunipero, *et al*., 2008). More importantly, supply chain management creates

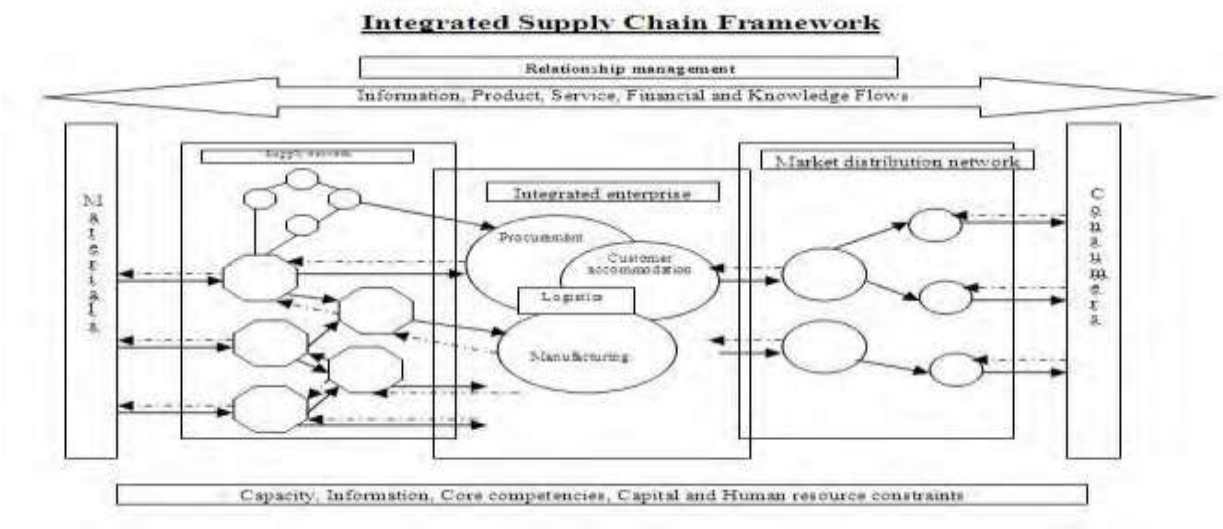
value for companies, customers and stakeholders whom interacting effectively and efficiently throughout the supply chain (Estampea, *et al*., 2013). Supply chain can be considered as a single chain for the reason that the flow of material, money and information can be effectively managed to meet the business requirements (Agarwa l& Shankar 2002). Supply chain management consists of collaborating firms of upstream and downstream to improve operating efficiency and effectiveness of the chain. The supply chain relationship among the firms involved reflects strategic choice. Supply chain operations require managerial processes that span across functional areas within individual firms and link trading partners and customers across organizational boundaries.

Logistics, in contrast to supply chain management, is the work required to move and position inventory throughout a supply chain. As such, logistics is a subset of supply chain management and occurs within the broader framework of a supply chain. Logistics is the process that creates value by timing and positioning inventory. It is the combination of a firm's order management, inventory, transportation, warehousing, materials handling, and packaging as integrated throughout a facility network. Integrated logistics serves to link and synchronize the overall supply chain as continuous process and is essential for effective supply chain connectivity (Bowersox *et al.,* 2000). Supply chain management can be viewed as a systemic and strategic coordination of operational functions both within a given company and also between supply chain partners working within a chain, with a view towards improving the long- term performance of each company that is part of the chain and of the whole of the chain itself (Mentzer, *et al*., 2001).

The Global Supply Chain Forum identified eight key processes that make up the core of supply chain management (Cooper, et. al., 1997): customer relationship management, customer service management, demand management, order fulfillment, manufacturing flow management, procurement, product development and commercialization and returns management. The general concept of an integrated supply chain is typically illustrated by a line diagram that links participating firms into a coordinated competitive unit in Figure 2.1 below. An integrated supply chain is multi- firm relationship management within a framework characterized by capacity limitations, information, core competencies, capital, and human resource constraints. Within this context, supply chain structure and strategy results from efforts to operationally link an

enterprise with customers as well as the supporting distribution and supplier networks to gain competitive advantage. Business operations are therefore integrated from initial material purchase to delivery of products and services to end customer. Value to the partners results from the synergy among firms comprising the supply chain with respect to five critical flows: information, product, service, financial, and knowledge (Bowersox *et al*., 2000).

Figure 1 Integrated Supply Chain Framework. Source: Adapted from supply chain faculty of Michigan State University (Bowersox *et al*., 2000).



Each firm engaged in a supply chain performs logistical activities. Such logistical activities should be integrated within that firm and within overall supply chain performance. The generalized supply chain arrangement illustrated in Figure 2.1 above, logically and logistically links a firm and its distribution and supplier network to end customers. This means that the integrated value-creation process must be managed from material procurement to end-customer product and/or service delivery. The integrated supply chain perspective shifts traditional channel arrangements from loosely linked groups of independent businesses that buy and sell inventory to each other toward a managerially coordinated initiative to increase market impact, overall efficiency, continuous improvement, and competitiveness (Bowersox *et al.,* 2000).

2.1.2. Supply Chain Strategy

Supply chain management (SCM) is a critical success factor for today's businesses (Duarte & Machado, 2011). A supply chain strategy specifies how a firm will achieve its competitive advantages through its supply chain capabilities, such as cost efficiency, response speed and flexibility (Ismail & Sharifi, 2006). A supply chain strategy also specifies how the manufacturing, purchasing, marketing, and logistics functions work together to support the desired competitive strategy (Qi, Zhao & Sheu, 2011). Therefore, companies should understand customers' needs, and to choose and implement the appropriate supply chain strategy to satisfy customer demands.

Deciding on using an optimal supply chain strategy requires a trade-off between key variables (Amb & Badenhorst- Weiss, 2011). A supply chain strategy is part of the overall business strategy, designed on the basis of competition (innovation, low cost, service, quality) (Hugo, et.al. 2011). It is integrated with the marketing strategy, customers' needs, the product strategy, and power position (Hugo, *et al*., 2011). Supply chain strategies are essential to the success of most contemporary businesses (Hines, 2006). For a company to be effective, its supply chain strategy must align with its competitive strategy (Chopra & Meindl, 2010).

There are two generic strategies in supply chain management, namely the lean and agile strategies (Pandey & Garg, 2009). Leanness means developing a value stream to eliminate all waste, including time, and to enable a level schedule. Agility means using market knowledge and a virtual corporation to exploit profitable opportunities in a volatile Marketplace (Manson-Jonesetal., 2000).(a) Alean supply chain is concerned with cost reduction by operating the basic processes with a minimum of waste (Qi *et al*., 2009). The primary objective of a lean supply chain can be realised by using the most basic forms of data communication on inventories, capacities, and delivery plans and fluctuations within the framework of just-in-time (JIT) principles (El-Tawy & Gallear, 2011). The key features of a lean supply chain strategy are predictable market demand; a lowest-price criterion; product supply based on forecasts; a long product life cycle; and long order lead time (Gattorna, 2006). Many organizations have successfully implemented and are benefiting from lean strategies (Duarte & Machado, 2011). (b) Agility is a comprehensive response to the business challenges of profiting from rapidly changing, continually fragmenting global markets for high-quality, high-performance, customer-

configured goods and services (Iskanius, 2006). The main objectives of agility are based on competition, business practice, corporate structures, strategic response, adaptability, building defenses against competitors, a paradigm shift, a step towards innovation, and the promise of a business world based around cooperation (El-Tawy & Gallear, 2011). Hence, agility is an appropriate strategy when coping with turbulence and reconfiguring operations to enable individual customer specifications to be accommodated in high-volume manufacturing. Agility not only responds to changing market conditions, but also to exploiting changing opportunities (Baker, 2008). Agility in a supply chain is the ability of the supply chain as a whole, and its members, to rapidly align the network and its operations to dynamic and turbulent requirements of the customers (Duarte & Machado, 2011). The main focus is on running businesses in network structures with an adequate level of agility to respond to changes while proactively anticipating changes and seeking new emerging opportunities (Sharifi, et. al., 2006). Agility measures how well the relationships involved in the processes can be enhanced and widely accepted as a winning strategy for growth (Ismail &Sharifi, 2006). The key elements of an agile supply chain include: being information driven; having market sensitivity or demand-driven); having integrated processes; and being network-based (Amir, 2011). (c) A leagile supply chain is a hybrid of lean and agile strategies. It is a system in which the advantages of leaness and agility are combined' (Krishnamurthy &Yauch, 2007). Leagile supply chains aim to infuse competitiveness in an organization in a cost-effective manner (Amir, 2011). The combination of lean and agile paradigms within a total supply chain strategy enable the positioning of the decoupling point so as to best respond to a volatile demand downstream, and yet still provide a level schedule upstream from the decoupling point(Rahimnia & Moghadasian,2010). In this hybrid strategy, lean focuses on waste elimination, achieving low-cost delivery of a standardized and stable product, while agility responds to complexity brought about by constant and unpredicted changes (Duarte & Machado, 2011). A company can choose a supply chain strategy based on the nature of its products, and by matching the strategy to the unique characteristics of different products or markets (Sebastiao & Golicic, 2008). The important factors to determine a supply chain strategy include: the nature the products (standard or special); the nature of the demand (stable or volatile); replenishment lead times (short or long) (Christopher, Peck & Towill, 2006). There exists a trade-off between efficiency and responsiveness is required to determine a supply chain strategy (Chopra and Meindl 2010).

Therefore, there are several factors that can be considered deciding on an appropriate supply chain strategy (Ambe & Badenhorst-Weiss, 2011). Among the determining factors, the product characteristics are more important (El-Tawy & Gallear, 2011). In addition to the product characteristics, factors like as core competencies of the organization; capabilities of the supply chain members; and decision drivers are significant to decide on an optimal supply chain strategy (Chopra & Meindl, 2010). Therefore, one can understand that implementing appropriate supply chain strategy enables to achieve a better supply chain performance in terms of responsiveness and efficiency over that of rivalries in a given industry. Using mismatched strategies and supply chain strategies based on a one-size-fits-all strategy often fails.

2.2. Empirical Literature Review

2.2.1. Supply chain performance and score model

Drivers of supply chain management performance.

To increase a firm's performance, the drivers of supply chain management are much valuable (Soni and Kodali, 2010). Drivers of supply chain performance management are facilities, logistic management, transportation, inventory management, information distribution, pricing and sourcing. The better management of all these activities leads to increase a firm's performance. Sunil Chopra and Meindl (2007) identified six drivers of supply chain performance. A company can enhance its responsiveness (effectiveness) and efficiency by the good management of the six drivers of supply chain performance. They elaborated following six drivers of supply chain performance as facilities, inventory, transportation, information, sourcing and pricing.(a) Facilities: factories warehouses and storerooms are the facilities in supply chain management.

The better management about the location, capacity and flexibility of these facilities has a positive effect on supply chain performance. Managers face atrade- off between responsiveness and efficiency (Taylor, 2004) to be resolved. If factories and warehouses are built with a lot of excess capacity, they can be very flexible and respond quickly to swings in product demand (Nel & Badenhorst- Weiss, 2010). In contrast, capacity costs money, and excess capacity is idle capacity not in use and not generating revenue. So the more excess capacity there is, the less efficient the operation becomes (Ambe & Badenhorst-Weiss, 2011). In facilities management a company proved to be more responsive or more efficient but not at same. A company having

many warehousing facilities show responsiveness of distributor but at the same time his efficiency becomes low due to high cost for warehousing. In contrast, if it has fewer warehouses only at main points then, it becomes more efficient due to low cost of warehouses but its responsiveness is very low. Therefore, there is a trade of between supply chain effectiveness and efficiency following warehouse facility decision. (b) Inventory means the flow of all material in supply chain activities such as from raw material to finished goods. Retailers can be more responsive by storing large inventory but efficiency becomes low owing to high inventory cost (Sunil Chopra and Meindl, 2007). In inventory management, there exist a trade-off between responsiveness and efficiency (Nel & Badenhorst -Weiss, 2010). Holding large amounts of inventory allows a company or an entire supply chain to be very responsive to fluctuations in customer demand (Bowersox *et al*., 2010). However, creating and storing inventory is a cost and to achieve high levels of efficiency, the cost of inventory should be kept as low as possible. An organization can be responsive by stocking high levels of inventory for a wide range of products (Chopra &Meindl, 2010). Vendor-managed inventory (VMI) is efficient for manufacturers. Authors found that that the efficiency and responsiveness of vendor managed inventory is higher than that of organization's self-managed inventory (Tanskanen *et al.,* 2009). (c) Transportation is the means of mobilizing the inventory flow from one place to another place. By using fast transportation service we can increase responsiveness but efficiency becomes low due to high cost of fast transportation and more chances of damage and the vice-versa (Sunil Chopra and Meindl, 2007). In terms of transportation, the trade-off between responsiveness and efficiency is manifested in the choice of transport mode (Taylor, 2004). Fast modes of transport are very responsive but also more costly. Slower modes are very cost efficient but not responsive.

Since transportation costs can be as much as one - third of the overall operating cost of a supply chain, these decisions are very important (Jonsson, 2008). A better transportation approach for manufacturing firms is joint routes planning. To enhance efficiency and responsiveness, the manufacturing firms must continue their transportation function in collaboration with the firms outside internal environment. Joint route planning can be achieved by two ways that are outsourcing transportation function (contracting with third parties to distribute the final product to customers at low cost) or horizontal cooperation with other firms (contracting with the firms of same type for collaboration to distribute the products) to achieve the economies of scale by decreasing the distribution cost. Joint route planning concept save 30.7 percent costs in

comparison with traditional transportation system (Cruijssen *et al*., 2007). (d) Information refers collection, analysis and sharing of relevant supply chain information among supply chain partners. Information provides customers' taste and requirements to supplier that leads supplier's responsiveness and efficiency because supplier forecasts customer demand and only supplies required product (Sunil Chopra and Meindl, 2007). Information Technology enables supply chain members to establish partnerships for better supply chain performance (Fawcett *et al.*, 2007). Accurate and timely information allows a firm to minimize inventories, improve routing and scheduling of transportation vehicles, and generally improve customer service levels (Barve, 2011). Modern information technology makes possible the fast and safe transmission and processing of extensive amounts of data, both internally for users within the company, and externally for suppliers and customers (Shukla *et al.*, 2011). High levels of responsiveness can be achieved when companies collect and share accurate and timely data generated by operations (Nel & Badenhorst- Weiss, 2010). End-to-end visibility of information is a key enabler for an agile supply chain (Duarte and Machado, 2011). This means, information sharing in the supply chain, enhances the efficiency and effectiveness of the firms of the supply chain partners. (e) Sourcing refers to the set of business processes required to purchase goods and services (Hines, 2006). It also means how and by whom different activities of supply chain management to be performed such as manufacturing, storing and transportation. Sourcing decision affects the level of efficiency and responsiveness of the supply chain. Outsourcing certain processes to other parties may increase a supply chain's efficiency, but may reduce its responsiveness due to possibly longer lead times to achieve economies of scale (Nel & Badenhorst- Weiss, 2010) or due to longer distances. (f)Pricing is the process by which affirm decides how much to charge customers for its goods and services. Pricing affects the customer segments that choose to buy the product, as well as customer expectations. This directly affects the supply chain in terms of the level of responsiveness required, as well the demand profile that the supply chain attempts to serve (Chopra &Meindl, 2010). Customers expect low prices and steady prices also ensure that demand stays relatively stable for price elastic demand. Therefore, pricing affects the behaviour of the buyer of the product and the performance of the supply chain. Customers who value responsiveness will pay more for higher levels of customer service (Nel & Badenhorst-Weiss, 2010). If a transportation company charges high and low costs for quick and late delivery respectively, then efficiency oriented customers demand quick delivery and responsiveness

oriented customers demand late delivery (Sunil Chopra and Meindl, 2007). This means, the price of a product varies with transportation cost in line with responsiveness and efficiency as well as customers' demand.

2.2.2 Supply chain performance

Supply chain performance can be measured both in terms of customers' level of satisfaction and the costs incurred (Estampea, *et al*., 2013). Customer's satisfaction level is a sign of the required standard service level of a company, which is closely related to the whole performance of its supply chain (Chan, 2003). Evaluating supply chain performance is a complex process as it involves several actors collaborating and interacting each other to achieve a given strategic supply chain objectives (Estampea, *et al.,* 2013). Companies to improve the overall supply chain performance and to track the supply chain operations, they share supply chain information among the partners to reduce the lack of demand visibility as it goes from downstream end customer to upstream partners in the chain, work closely with customers and suppliers in order to improve information and product flows, and reduce surprises from demand fluctuations, enhance internal processes integration, work with suppliers to reduce lead times, reduce risk of supply disruption, mitigate the bullwhip effect, reduce supply chain cost of all members through collaboration and trust. (Krajewski, *et al*., 2010). Supply chain performance is influenced by several factors like sourcing strategy, distribution strategy and, inventory management strategy, collaboration with partners, information technology, etc.

According to Jonsson (2008), strategic sourcing and the development of the supplier relationship is really significant for the company's and supply chain performance. The efficiency and the competitiveness of the company's supply chain can be affected by the choice of, sourcing strategy, collaboration strategy with suppliers. Suppliers are as equally important as the customers for a company's performance and competitiveness. The level of relationship and collaboration between the suppliers and a company has been summarized as shown below:

Table 1 THREE LEVELS OF CUSTOMER-SUPPLIER RELATIONSHIP (JONSSON, 2008, P.184)

S/N	Level of Company-Supplier Relationship	Description
1	Partnership suppliers	• Long –term relationship exists. • The highest level of relationships with suppliers. • Relationship also includes joint product development, frequent exchange of information on products, delivery, inventory, demand forecast, replenishment and quality issues.
2	Associated suppliers	• Relationships are long term and reviewed periodically. • Suppliers guarantees quality of supplies and no need to carry out quality controls on deliveries.
3	Conventional Suppliers	• Lower level relationship due to single order. • Price is one of the selection criteria. • low frequency and the evaluation and selection takes place for each procurement

Therefore, developing and maintaining partner relationships with few dependable suppliers will reduce risk, save time, cost and resources (Jonsson, 2008). A firm's quality management approaches and supply chain management practices complement each other and need to be integrated to achieve superior financial and business performance (Mellat-Parast, 2013).This means, the higher the supply chain performance, the greater will be its contribution for quality management and organizational performance. Practices such as supplier relationship and information sharing facilitate the integration of quality management and supply chain management.

The supplier's quality practices have a significant effect on the quality performance of the firm (Mellat- Parast, 2013). According to (Lo *et al*., 2007), customer focus, continuous improvement and total involvement of suppliers would improve supply chain performance. Supply Chain Management is a key strategic factor for increasing organizational effectiveness and efficiency (Gunasegaram, *et al.,* 2001). Organizations achieve their goals by satisfying their customers with greater efficiency and effectiveness than their competitors (Neely, *et al.,* 1995). Effectiveness refers to the extent to which customer requirements are met, while efficiency is a measure of

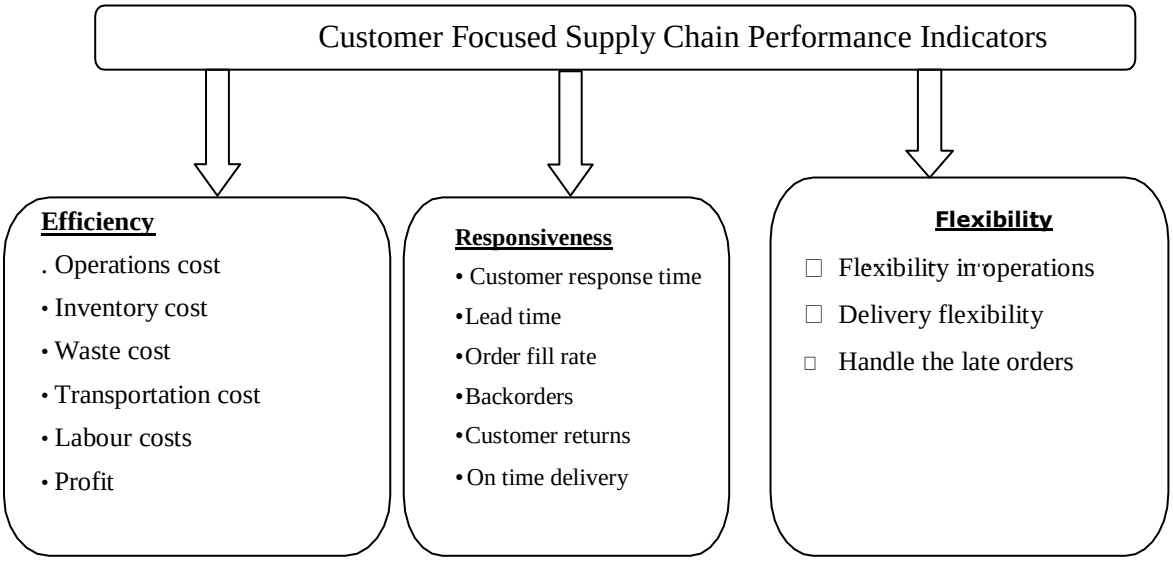
how economically the firm′s resources are utilized when providing a given level of customer satisfaction. Improving supply chain performance is one of the critical issues for gaining competitive advantages for companies (Cai, *et al.,* 2009). Supply chain performance measurement is the process of quantifying the efficiency and effectiveness of the upstream and downstream supply chain processes. A performance measure is a set of metrics used to quantify the efficiency and/or effectiveness of the supply chain operation. The main challenge is to identify the key performance measures for value- adding supply chain processes and the factors that will affect the core business processes that create wealth to customers (Gunasekaran & Kobu, 2007). Many organizations endeavor to capture the benefits of shorter lead times, flexibility in production, shorter product development time and win-win approaches (Gopal & Thakkar, 2012). Designing and implementing the supply chain performance measurement system is a challenging task and companies may encounter the following problems (Gopal & Thakkar, 2012): lack of connection with strategy, focus on cost neglecting non-cost indicators, lack of a balanced approach, insufficient focus on customers and competitors, lack of a clear distinction between metrics at strategic, tactical, and operational levels. Studies indicate that supply chain performance system are not in harmony with the organization's strategy and also there is a biased focus on financial metrics (Holmberg, 2000). A set of supply chain performance metrics needs to be determined in order to measure maximum effectiveness and minimum operating cost (Gunasekaran & Kobu, 2007). When the Supply Chain performance measures developed, managers should identify the KPIs that have to be enhanced and figure out the relationships between the different key performance indicators and the priorities to improve in the supply chain operations (Cai, *et al*., 2009). There are different performance indicators that companies use to assess the performance of the supply chain.

The following parameters can be used to evaluate the performance of the supply chain (Rejewski & Ritzman, 2002): (a) Lead time – the time interval between placing purchase order and delivery of the product to the customer. (b) Cost of order processing, shipping and delivery. (c) Capacity- including warehousing, transportation and shipping capacity. (d) Quality of suppliers - the ability to meet quality standards set by manufactures. (e) Delivery has three dimensions including delivery speed, production lead time & delivery reliability (Coyle *et al.* 2003). (f) Flexibility (ability to adapt to their changing environment). Flexibility has four dimensions (Chopra & Meindl ,2004):

(I) Customer service flexibility-refers to the ability to provide the special customer requests or inquiries. (II) Order flexibility- means the ability to adjust order size, volume or composition during logistics operation. (III) Location flexibility refers the ability to service customers from alternative wholesaler locations or supermarket outlets (IV) Delivery time flexibility refers to the ability to provide delivery times for customers. Non-Financial supply chain Performance Measures includes the following:

(a) Customer service level -there are four types of customer service level in manufacturing such as order fill rate, stock out rate, back order level and delivery probability. (b) Cycle time or lead time is the end-to-end delay in a business process for every organization. (c) Inventory Levels. (d) SC Resource Utilization. The below diagram represents the summary of customer – focused supply chain performance indicator.

Figure 2 Customer –focused supply chain performance indicators



Gunasekaran, *et al*. 2004

There are several methods of measuring and evaluating the performance of supply chain. The most common methods are SCOR (Supply Chain Operations) model and the Balanced Scorecard (BSC). As this thesis is focusing on the performance variables of the SCOR model, the performance metrics, processes of supply chain management supply chain practices and collaboration have been discussed.

2.2.3 Supply chain operation reference (SCOR) model

Supply chain performance measurement is essential for competitiveness as it provides information about strengths that need to be maintained and on weaknesses that need to be addressed. The Supply Chain Operations Reference model (SCOR) is the product of Supply Chain Council, Inc. (SCC). SCC established in 1996 and developed the SCOR process reference model 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 to improve the effectiveness of supply chain management and related supply chain improvement activities (http://supply-chain.org/scor). SCOR consists of standard supply chain processes, standard performance attributes and metrics, standard practices and standard job skills (Alomar and Pasek 2014). The main supply chain processes are plan, source, make, deliver, return and Enable. In terms of performance, SCOR enables to assess reliability, responsiveness, agility, costs and assets management of a given supply chain. In order to identify, measure and improve supply chain management processes, SCOR model can be used. The SCOR model provides a common process for communicating among supply-chain partners (Huan, *et al*., 2004). The SCOR-model has been developed to describe the business activities associated with all phases of satisfying a customer's demand. The model has been able to successfully describe and provide a basis for supply chain analysis and improvement. These processes are defined in increasing levels of details beginning with a description of the overall process. The processes are further divided into process elements, tasks, and activities. Each basic supply chain is a "chain" of source, make, and deliver execution process. Each interaction of two execution processes (source-make-deliver) is a "link" in the supply chain. Planning sits on top of these links and manages them (Huan, *et al*.,2004).

Figure 3 SCOR's six major management processes. Source: SCOR MODEL, Version.11 (2012).

The model spans: all customer interactions (order entry through paid invoice), all physical material transactions (supplier's supplier to customer's customer, including equipment, supplies, spare parts, bulk product, software, etc.) and all market interactions (from the understanding of aggregate demand to the fulfilment of each order). The SCOR reference model consists of 4 majors ections:

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. However, this study will focus on the supply chain management processes integration and performances as well as practices. The SCOR performance section consists of two types of elements: performance attributes (characteristics) and performance metrics. A performance attribute is a grouping of metrics used to express a strategy.

Table 2 The SCOR Performance attributes metrics and definition.

Supply Chain Performance Attribute/Variables /Characteristics	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 labour costs, material costs, and management and transportation costs. A typical cost metric is Cost of Goods Sold.
Asset Management Efficiency (Inventory Management).	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.

SCOR Model Version.11 (2012)

Reliability, Responsiveness and Agility are customer-focused performance characteristics. Cost and Asset Management Efficiency are internal-focused performance characteristics. Each performance attribute has one or more strategic performance metrics as indicated in the above

table. SCOR supply chain processes are unique processes a supply chain requires to execute in order to support its primary objective to fulfill customer orders. SCOR provides a set of processes most companies perform to effectively execute their supply chains. The six macro-level SCOR processes: Plan, Source, Make, Deliver, Return and Enable are well-known and widely adopted. (i) The Plan processes describe the activities associated with developing plans to operate the supply chain. The Plan processes include the gathering of requirements, gathering of information on available resources, balancing requirements and resources to determine planned capabilities and gaps in demand or resources and identify actions to correct these gaps. The processes associated with determining requirements and corrective actions to achieve supply chain objectives (www.supply-chain.org/Scor). (ii)The Source processes describe the ordering (or scheduling of deliveries) and receipt of goods and services. The process is associated with ordering, delivery, receipt and transfer of raw material items, subassemblies, product and/or services. The Source process expresses the issuance of purchase orders or scheduling deliveries, receiving, validation and storage of goods and accepting the invoice from the supplier (www.supply-chain.org/Scor). (iii)The Make processes describe the activities associated with the conversion of inputs in to finished products for customers .The most common manufacturing strategies are make-to-stock, make-to-order, configure-to-order, and engineer-to-order (Webster, 2008). Make-to-stock (MTS) strategy is the best strategy for standardized products that sell in high volumes (Cohen & Rousell, 2005). Make-to- order (MTO) is the preferred strategy for customized products or products with infrequent demand. Companies following this strategy produce a shippable product only with a customer order in hand (Taylor, 2004). Configure-to-order (CTO) is a hybrid strategy in which a product is partially completed to a generic level, and then finished when the order is received (Cohen & Rousell, 2005). This is the preferred strategy when there are many variations to the end product, and the manufacturer wants a lower finished-goods inventory and shorter customer lead time (Bowersox *et al*. 2010). Make-to–stock products are intended to be shipped from finished goods or 'off the shelf'. They are generally produced to a planned schedule in accordance with a sales forecast. Make-to-Order products are completed, built or configured only in response to a customer order. (iv) The Deliver processes describe the activities associated with the creation, maintenance and fulfillment of customer orders. The Deliver process expresses the receipt, validation and creation of customer orders, scheduling order delivery, pick, pack and shipment and invoicing the customer.

The Deliver Retail process provides a simplified view of Source and Deliver processes operated in a Make-to-Stock-only retail operation. Deliver- the processes associated with performing customer-facing order management and order fulfillment activities. (v)The Return processes describe the activities associated with the reverse flow of goods. The Return process represents the identification of the need to return, the scheduling of the return and the shipment and receipt of the returned goods. The Return processes are associated with moving material from a customer back through the supply chain to supplier for different reasons. (vi)The Enable processes is associated with the management of the supply chain. Enable processes include management of business rules, performance management, data management, resource management, facilities management, contract management, supply chain network management, managing regulatory compliance and risk management. This process is associated with establishing, maintaining and monitoring information, relationships, resources, assets, business rules, compliance and contracts required to operate the supply chain. Enable processes support the realization and governance of the planning and execution processes of supply chains. (SCOR Version.11, 2012). A SCOR 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 processes between organizations. All practices have links to one or more processes and one or more performance metrics. There are several different types of practices within any organization like: emerging practices, best practices, standard practices, etc. Emerging practices introduce new technology, knowledge or radically different ways of organizing processes. Emerging practices may yield a step change in performance by 'redefining the playing field' within an industry. Emerging practices require advanced technology, or special knowledge to adopt. Among other things, the SCOR emerging practices include demand planning and forecasting, supply network planning, demand management, long-term supplier agreement and relationship, supply chain optimization, etc. which have significant impact on the performance of a given supply chain network. Best practices are current, structured and proven practices. Best practices have a positive impact on supply chain performance. Among other things, the SCOR best practices include the issues of supply chain risk management, inventory management, delivery performance evaluation, etc. which are key to the performance of a given supply chain process network.

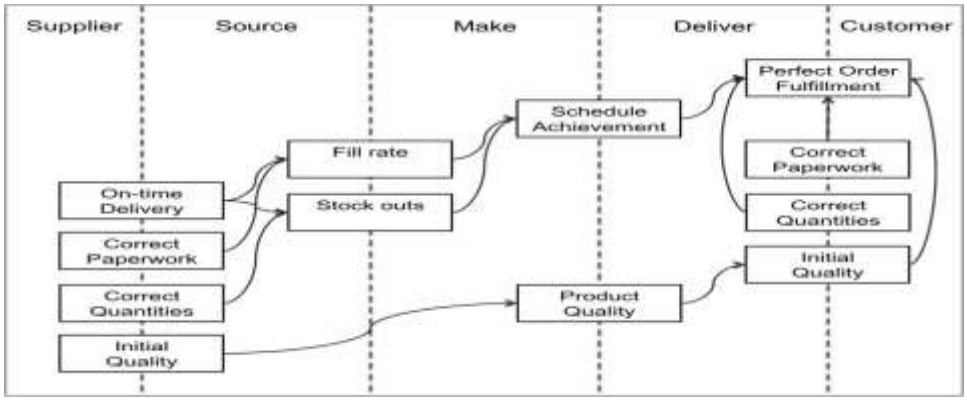
The following table summarizes the five performance attributes and SCOR strategic supply chain metrics.

Table 3.Strategic supply chain performance variables and metrics. Source: SCOR Version.11, (2012)

Supply chain Performance Variables	Strategic Supply Chain Performance Metrics
Reliability	Perfect Order Fulfilment
Responsiveness	Order fulfilment Cycle Time
Agility	Flexibility and Adaptability
Cost	Total Cost SC operation
Assets	Efficient supply chain asset utilization.

Defining the supply chain metrics at strategic level, then operational metrics should be derived from the strategic metrics for each SCOR supply chain process as shown in the below diagram.

Figure 4 SCOR operational supply chain performance metrics and process.



2.2.4. Supply chain integration & collaboration

The paradigm of supply chain management has gone through huge developments efforts to enhance the benefit out of it. Supply chain management seeks to enhance competitive performance by integrating the internal cross-functional units within a company in the supply chain and effectively linking them with the external operations of suppliers, customers, and other channel members to be successful (Otchere *et al*., 2013).

The objective of supply chain management is to maximize the overall value generated by the supply chain rather than profit generation by a single member company. Although the importance of supply chain integration is widely acknowledged, seamless coordination is rarely achieved in practice owing to several challenges (Hussain and Nassar, 2010). In recent years, there has been a great deal of empirical evidence to show that successful supply-chain integration can improve a firm's performance and competitive advantage (Wiengarten *et al.*, 2010). Internal integration involves cross functional teams of specialists working together, sharing information, making product and making manufacturing decisions jointly and simultaneously (Otchere *et al.* 2013). Internal integration is a process of inter-functional interaction, collaboration, coordination, communication and cooperation that bring functional areas together into a cohesive organization (Zhao *et al*, 2011). Companies with a low internal integration strategy will achieve low level of external integration and companies implementing the full internal integration strategy will have the highest levels of external integration. Generally, it is believed that firms achieve a relatively high degree of internal integration before they attempt to develop a higher degree of external integration (Otchere *et al*.2013).

According to (Otchere *et al,* 2013), external integration is the other aspect of supply chain integration among the supply chain partners to gain competitive advantages over competitors. As the competitive environment is becoming increasingly challenging, companies are undertaking efforts to compete along multiple fronts. Nowadays, many firms find it difficult to compete in the competitive market environment by relying on their internal resources and competencies alone. They are becoming aware of the importance of collaboration with their customers and suppliers to obtain information and complementary resources so as to build competitive advantages. External supply chain integration reveals two major areas of emphasis: (a) customer integration (CI) and (b) supplier integration (SI). Customer integration is also known as forward integration which refers to the process of interaction and collaboration between an organization and its customers to ensure an effective flow of products, information and resources to customers (Zhao *et al*. 2002). Customer integration involves sharing demand information which enables the manufacturer to understand better the customer needs and to forecast better customer demand, as well as collaborative involvement of customers with respect to product design, provision of better quality products at lower cost and more flexibility in responding to customer demand (Flynn *et al.* 2010). Supplier integration is also known as backward integration which refers to

the process of interaction and collaboration between the manufacture and its suppliers to ensure an effective flow of input supplies (Zhao *et al*, 2011). Supply chain management executives face unique challenges in the endeavor to integrate supply chain strategies with the overall corporate business (competitive) strategies and hence, coordination is rarely achieved in practice (Otchere *et al*, 2013). Most supply chain integration challenges emanate either from uncertainties or inability to co-ordinate several activities and partners. Customers are demanding better quality products, higher levels of service and reduced prices (Sweeney, 2011). Studies indicates that there is no blueprint for integration and aggregate measure of overall supply chain performance from which a firm could compare performance with other industry members (Fawcett & Magnan, 2002). The supply chain operations reference (SCOR) model provides a common supply chain framework, standard terminology, common metrics associated benchmarks, and best practices, the approach seems rigid (Soni and Kodali,2010).

To increase a firm's supply chain performance the drivers of supply chain management play insensible roles. Drivers of supply chain performance management include facilities, logistic management, transportation, inventory management, information distribution, pricing and sourcing. The better management of all these activities leads to increased performance of firms (Soni and Kodali, 2010).

The integration process should start from functional integration within each company through internal integration to external integration (Supplier & Customer). Authors argue that performance improvements are not assured with just one aspect of supply chain integration. Implementing integration with upstream and downstream supply chain members as well as internal functional integration is essential for effective and efficient supply chain performance (Otchere *et al*, 2013). Furthermore, it is confirmed that, the best integration strategy must involve "complete integration" (Otchere *et al*, 2013). A number of researchers have also found that higher levels of integration generally lead to better supply chain performance (Gimenez and Ventura, 2005). Some researchers used all three integration variables in assessing the effect of supply chain integration on performance and found that supply chain integration directly relates to the firm's performance and that internal and external integration influence each other along with performance. However, internal integration's impact on performance depends on the functional areas that are being integrated and the level of external integration (Flynn *et al*.2010).

Firms have realized that enhanced market competitiveness requires complete integration of companies within a network of organizations in the supply chain. It is the extent to which organizations integrate with their supply chain "partners" that determines their competitiveness (Christopher, 2011).

From these different findings, we understand that company's complete integration with the supply chain partners has significant impact on the performance and competitiveness of the case supply chain in this study. Supply chain integration with upstream and downstream partners can be reflected through the implementation of collaborative planning, forecasting and replenishment (CPFR) scheme as well as vender managed inventory (VMI) arrangement. Accordingly, for the purpose of this study, the researcher reviewed literatures on CPFR and VMI as discussed in detail below.

2.2.5 Collaborative, Forecasting, planning & Replenishment (CFPR)

It is a process which stands for collaborative planning, forecasting and replenishment in the supply chain. The idea behind this process is to make collaborative actions by all members of the supply chain to come up with a shared vision and objective. Supply Chain partners along the chain share information based on customer trends and needs to create a single forecast that is visualized at all times by its members to react accordingly to sudden changes in demand (Cassivi, 2006). Retailers have the advantage of knowing the latest trends and customer's behaviours. Large manufacturers are implementing CPFR as a model to forecast and plan actions based on collaboration with retailers (Fliender, 2003). CPFR process generates cost reductions in large manufacturers due to short lead times and specially controls on the inventory levels in the supply chain (Caridi *et al*., 2006). Efficient consumer response is a strategy where retailers and suppliers work together in a cooperative manner to bring products to the final customer in a more efficient, faster, less expensive but still profitable way to the members of the supply chain (Corsten and Kumar, 2005). CPFR is the integration of all the members of the supply chain including the retailers and all the distributers involved. The potential benefit of this process is seen with the sharing of the information throughout the supply chain if they are effectively coordinated (Fliender, 2003). The use of electronic methods such as advanced software facilitates sharing of information. Category management and efficient replenishment need to

implement collaborative forecasting and planning in order to establish win -win situations of trading partners (Holmstrom, *et al*., 2002).

A push-pull system is followed in a CPFR process. The push part of the supply chain is followed by upstream suppliers which work in a make – to - stock process in a just in time basis. Collaborative forecasts are used to determine lot sizes and stock level. This will ensure a low inventory on downstream companies. Downstream companies work in a make- to - order process or "pull" process. Based on historical data, they trigger the orders to the upstream suppliers to meet demands. The main objective of the system is quick response to rapid changes. CPFR increases level of relationship among the supply chain partners, improves the communication channels by jointly managing the process and sharing of information (Cassivi, 2006). Collaborative planning is a fundamental part of supply chain management. It is the first step of CPFR with two fundamental stages: front-end agreement and joint business plans. Partners also develop collaboration initiatives and terms (Cassivi, 2006). Absence of collaborative planning with supply chain partners leads to significant negative impacts on supply chain performance (Attaran, 2004). Trust and the quality of information, with advanced IT infrastructure, shared between companies has a significant impact on effective collaborative planning and the performance of a supply chain (Petersen, *et al*., 2005). Collaborative Forecasting reduces bullwhip effects and improves supply chain performance (Eksoz and Mansouri, 2012). According to (Voudouris, *et al*., 2008), the overall objective of collaborative forecasting is "to synchronize demand forecasts between all customers and suppliers". Collaborative forecasting increases the accuracy of the aggregate forecasts. The potential benefit of collaborative forecasting reduce inventory holding cost and shortage cost, optimizes the use of production capacity and adhere to production plans (Aviv, 2004). With all the challenges, collaborative forecasting enables to overcome inherent problems with traditional forecasting.

Owing to the complex nature of collaborative forecasting schemes, the challenges are categorized by Voudouris *et al*., 2008 as follow: human interactions and biases, traditional behaviors, communication and defining accountability among the partners. The importance of information technology to launch collaborative forecasting by supply chain partners has been addressed by many scholars (Aviv, 2007). Collaborative Replenishment is the third stage of CPFR, which includes making and fulfilling orders.

In the “replenishment” stage, it is required to generate orders according to sales forecast in order to connect collaborative replenishment directly to a forecasting activity (Liu and Sun, 2012). Collaborative replenishment spreads replenishment activities across the supply chain and facilitates collaborative inventory management in the supply chain operations. The benefits include improved customer service levels, increased order accuracy and decreased inventory. Transportation is also a key element in collaborative replenishment arrangements. There is relationship between collaborative transportation and CPFR. Collaborative transportation management (CTM) requires a conversion of order forecasts developed via CPFR into shipment forecasts, and insuring accurate fulfillment through collaboration (Esper and Williams, 2003). Companies should combine CTM and CPFR in order to integrate customer procurement forecast processes and logistics demands (Chen and Chen, 2009).

According to Panahifar *et al*., 2013, successful collaboration arrangement need key enablers. These enablers for CPFR implementation vary due to the differences of industries and characteristics of the supply chain. The important enablers include: the creation of a high level of trust (Panahifar *et al*., 2013) and the importance of information (Petersen *et al*., 2005), reduced information distortion in the supply chain (Nishat Faisal *et al*. 2007). Senior management support, commitment and a clear communication/business plan are also two key prerequisites for successful collaboration (Panahifar, *et al*., 2013). Significant inhibitors (barriers) to the successful implementation of CPFR include: absence of shared targets; lack of budget for collaborative software; lack of partner trust; difficulties to calculate benefits; executive support obstacles; lack of real time coordination of information exchange; no adequate information technology and expertise (Min and Yu,2008). According to Chung and Leung, 2005), lack of adequate collaborative software is one of the barriers to collaborative schemes. Fear of losing competitive information (financial reports, manufacturing schedules, inventory values, intellectual property issues and information sharing by adversaries), lack of technical expertise, the availability and cost of technology have been cited as some of the main obstacles to CPFR implementation (Cassivi, 2006). CPFR implementation challenges are of two levels: fundamental and technical consisting of lack of trust, lack of mutual incentives and the need for security protocols in order to safeguard both buyers and sellers from leaks of proprietary information (Attaran and Attaran, 2007).

Companies implementing CPFR successfully ensure the following benefits: forecasting accuracy, reducing the amount of exchanged information, reducing the bullwhip effect, increased responsiveness, enhanced customer service quality, improved inventory management, operational efficiency, product availability assurance, improving design process, stronger relationship between partners, decreased supply chain cycle time, increased customization capability, reduced replenishment cycle time, increased revenues and earnings, increased margins, increasing shareholder wealth, decreasing cost of production, planning and deployment, maximum efficiency of members, a reduction of inventory in the supply chain, decreasing working capital, reduction in production and inventory costs, reduced overall costs, increasing the sales of products and reduction in stock-outs (Kim and Mahoney, 2010). According to Larsen et al., 2003 , CPFR , as a collaboration initiative among two or more parties in the supply chain with joint planning like promotional activities ,synchronized forecasting, and undertaking joint replenishment processes, generates the following benefits: increased sales, higher service levels, faster order response time, lower product inventories, faster cycle times, reduced capacity requirements, reduced number of stocking points, improved forecast accuracy and lower system expenses.

2.2.6. Vendor Managed Inventory (VMI)

Vendor Managed Inventory (VMI) is a collaboration strategy where sales and inventory level information are usually shared by the customer with the supplier. In a typical VMI agreement, the supplier is given the authority and responsibility to make inventory replenishment decisions for their customers. Generally, the customer is not involved in decision making activities, but is responsible for sharing accurate and timely sales and inventory level information with the supplier. One of the earliest VMI agreements was pioneered by Wal-Mart (retailer) with Procter & Gamble (manufacturer) in the late 1980s. This agreement, originally known as Continuous Replenishment Program (CRP), gave Procter & Gamble the authority and responsibility to make appropriate inventory replenishment decisions for Wal-Mart. Vendor-managed inventory (VMI) is a family of business models in which the buyer of a product provides certain information to a supplier of that product and the supplier takes full responsibility for maintaining an agreed inventory of the material usually at the buyer's consumption location (usually a store).

A third-party logistics provider can also be involved to make sure that the buyer has the required level of inventory by adjusting the demand and supply gaps. VMI makes it less likely that a business will unintentionally become out of stock of a good and reduces inventory in the supply chain. One of the keys to making VMI work is shared risk. In some cases if the inventory does not sell, the vendor (supplier) will repurchase the product from the buyer. In other cases the product may be in the possession of the buyer but is not owned by the buyer until the sale takes place, meaning that the buyer simply houses and assists with the sale of the product in exchange for a predetermined commission or profit (sometimes referred to as consignment stock). VMI helps foster a closer understanding between the retailer and manufacturer by using Electronic Data Interchange formats EDI software and to forecast and maintain correct inventory in the supply chain (www.scor.org). VMI is a supply chain initiative whereby a supplier assumes responsibility for maintaining inventory levels and determining order quantities for its customers. A number of benefits from VMI adoption have been reported in literature: reduction in inventories, shorter order intervals and more frequent deliveries. A VMI program typically involves the use of a software platform, the sharing of demand forecasts and/or cost information, timely communications, set liability levels, and risk-sharing parameters and common goal sharing between the buyer and the supplier. VMI can be particularly beneficial in the products with high demand variance and high outsourcing costs (Cheung and Lee2002).

This literature review indicates that CPFR is one of the most important supply chain collaboration scheme out of which all the partners of the chain benefits as a result of the financial and non- financial supply chain performance. With the same taken, VMI is another important supply chain collaboration arrangement which has a significant impact on the performance of the supply chain as a whole. Therefore, this study will focus on the assessment of these two supply chain collaborative schemes with the case supply chain.

2.2.7 Supply chain coordination mechanisms

The dependencies between supply chain members can be managed by some means and mechanisms of coordination. By using coordination mechanisms, the performance of supply chain may improve. There are different types of coordination mechanisms discovered by different authors. Supply chain contract is the main coordination mechanism. Supply chain members coordinate by using contracts for better management of supplier-customer relationship

and risk management. The contracts specify the parameters (like quantity, price, time, and quality) within which a customer places orders and a supplier fulfills them. The objectives of supply chain contracts are: increasing the total supply chain profit, reducing overstock/ under stock costs and sharing the risks among the supply chain partners (Tsay, 1999). The contracts counter double marginalization that is by decreasing the costs of all supply chain members and total supply chain costs when they coordinate as against the costs incurred when the SC members act independently. In case of quantity flexibility contract, the customer is allowed to modify the order within limits agreed to the supplier as demand visibility increases closer to the point of sale. The buyer modifies the order as s/he gains better idea of actual market demand over time (Tsay, 1999). In revenue sharing contract, the supplier charges the customer a low wholesale price and shares a fraction of the revenues generated by the buyer (Koulamas, 2006). In the case of quantity discount contract, the seller offers discounts to the buyer based on quantity of goods purchased in order to improve the volume of sales (Weng, 2004). In the case of sales rebate contract, the sales rebate agreement provides a direct incentive to the retailer to increase sales by means of a rebate paid by the supplier for any item sold above a certain quantity to maximize sales.

2.3. Conceptual Framework

The research will rely mainly on the SCOR model framework for this study as discussed below. Globally there are over 800 SCC Member Organizations employing SCOR model. Countries like North America and Europe take the line share of the member distributions. Other member countries include China, Australia, South Africa, Latin America, Southeast Asia and Japan also employ the SCOR model of SCC in their organizations. SCOR is a supply chain process reference model containing over 200 process elements, 550 supply chain performance metrics, and 500 best practices. The Supply Chain Operations Reference model (SCOR) is the world's leading supply chain framework, linking business processes, performance metrics, practices and people skills into a unified structure. SCOR is organized around the six primary supply chain management processes of Plan, Source, Make, Deliver, Return and Enables, and five core supply chain performance attributes or characteristics: Reliability, Responsiveness, Agility, Costs, and Supply Chain Asset Management Efficiency. To this end, the researcher will try to analyze and evaluate the performance of supply chain management practices in terms of Reliability,

Responsiveness, Agility, Costs, and Supply Chain Asset Management Efficiency, collaboration with upstream and downstream supply chain partners and SCOR best practices as shown in the diagram below.

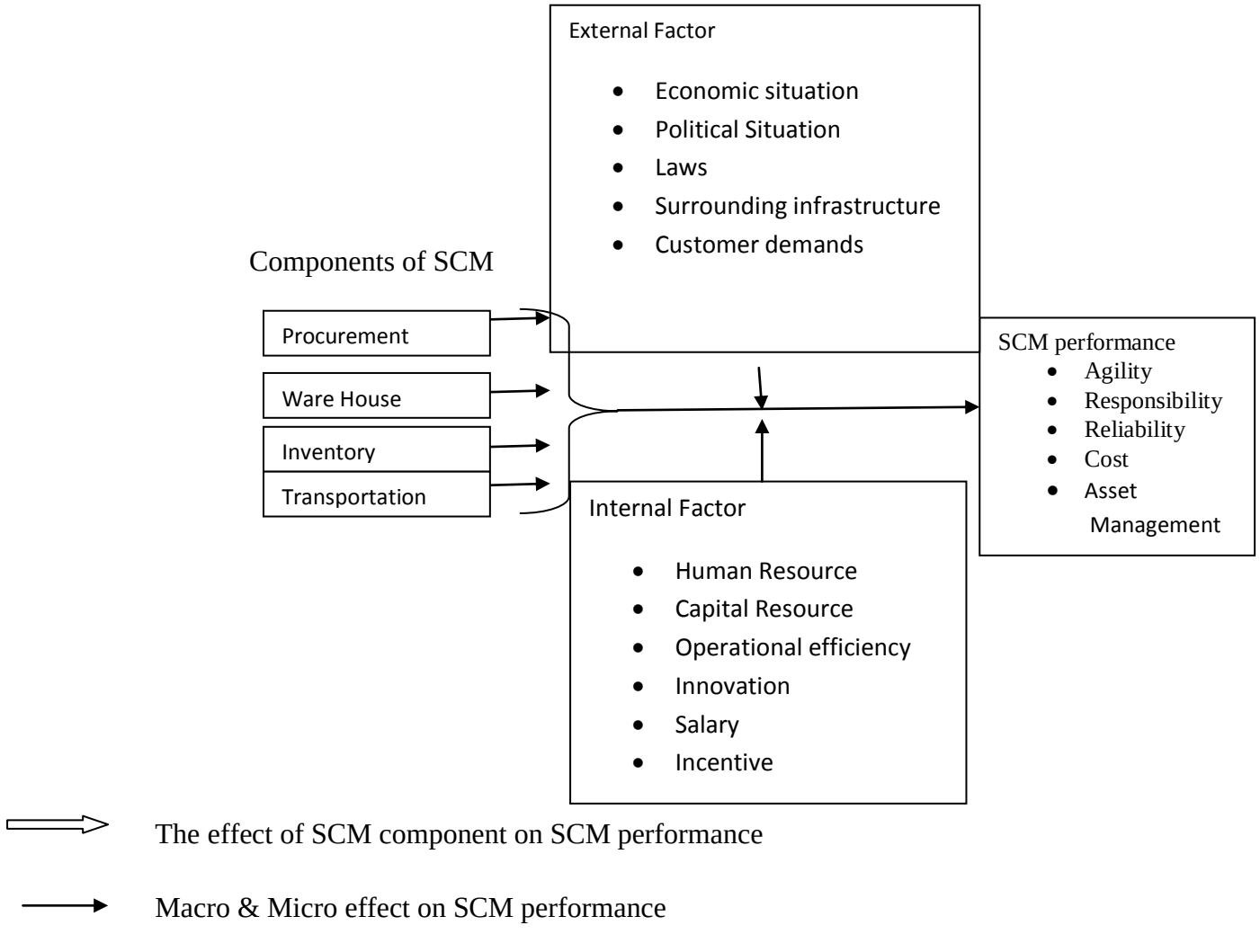


Figure 5 The conceptual framework of supply chain performance indicators for this study.

Macro problem affect supply chain performance of Brewery Company but this factor is not affect only Heineken brewery company but also anthers brewery factory in Ethiopian. Micro problem affect the internal environment like Human Resource, Capital Resource, Operational efficiency, innovation, salary and incentive. This problem differs from one factory to anthers.

CHAPTER THREE

Methods of the study

Introduction

In this chapter the research design and methodology used in the study has been described. The geographical area where the study will be conducted, the research design, the research approach, the subject of the study, the case companies, the participants of the study, the type of data source, the type of research, the research instrument used to collect the data, the methods of data collection, method of data analysis, validity and reliability of the instrument, ethical.

3.1. Description of the study Area

Heineken is one of the world's great brewers and is committed to growth and remaining independent. The brand that bears the founder's family name – Heineken – is available in almost every country on the globe and is the world's most valuable international premium beer brand. The Company's aim is to be a leading brewer in each of the markets in which it operates and to have the world's most valuable brand portfolio. The Company is present in over 70 countries and operates 140 breweries with volumes of 205 million hectoliters of beer sold in 2010 on a pro-forma basis. Heineken is Europe's largest brewer and the world's third largest by volume. Heineken is committed to the responsible marketing and consumption of its more than 200 international premium, regional, local and specialty beers and ciders. These include Amstel, Birra Moretti, Cruzcampo, Dos Equis, Foster's, Kingfisher, Newcastle Brown Ale, Ochota, Primus, Sagres, Sol, Star, Strongbow, Tecate, Tiger and Zywiec. On a 2010 pro-forma basis, including FEMSA Cerveza, revenue totalled €17 billion and EBIT (beia) was €2.7 billion. The average number of people employed is more than 70,000. Heineken N.V. and Heineken Holding N.V. shares are listed on the Amsterdam stock exchange. Prices for the ordinary shares may be accessed on Bloomberg under the symbols HEIA NA and HEIO NA and on the Reuter Equities 2000 Service under HEIN.AS and HEIO.AS. Most recent information is available on Heineken's website: 2018.

Heineken Ethiopia is taking its production to the next level with a new $150m greenfield brewery, which will add 1.5 million hectoliters capacity and complement its established facilities at Harar and Bedele.

Heineken Brewery SC has introduced two new beers to Ethiopian market called Sufi Buna and Walia 3.3.

This is the third attempt in almost one year where the company introduced a new beer. It is to be recalled that in June 2017, Heineken introduced WaliaRadler which has 2.5 percent alcohol content.

This time around–Sofi Buna—a nonalcoholic beer mixed with malt has come with a coffee taste. The second one–Walia 3.3–came with limited alcohol content: 4.5 percent.

Heineken first established itself in the Ethiopian market after acquiring Harar and Bedele brewery factories. At the time, the company bought the two factories from the government.

It first entered the market in August 2011, where it purchased the two factories from the then Privatization & Public Enterprise Supervising Agency (PPESA). The breweries were sold to Heineken for USD 163 million. At the time, the two factories had the capacity to produce 750,000 hecto-liters per year.

Currently, there are around seven breweries operating in Ethiopia with an annual production capacity of 12 million hectoliters and Heineken is among the leaders in the market.

Few researches show that BGI has the biggest market share with 38 percent followed by Heineken with at 30 percent market share.

Over the past one year, the very competitive brewery market in Ethiopia has shown a significant shift where BGI is now on the process of acquiring Raya Brewery and Zebidar.

Heineken Brewery Company competes on supply chain management rather than competing individually with internal competencies.

3.2. Research Design

In this research descriptive and exploratory study design using quantitative method used to analyze for data collected from respondents. The researcher used two sources of data to collect information. These are primary (Questioner and interview) .Based on the above literature review on research strategies, the appropriate research strategy to be used for this research is a case study to investigate "what "the perceptions of the respondents are about the level practice of the supply chain management practices, to get insight about "how much" the case brewery company in Addis Ababa implement the supply chain management philosophies. The other justification for the selected strategy is that the purpose of this study is descriptive and determining the level of perceived practice, the researchers generate answers to "what" and "how "research questions.

3.3. Research Approach

In this research approach is mixed methods. In case study, the data collection techniques include semi-structured interview for qualitative data and questionnaire for quantitative data .

Generally, qualitative techniques including focus group discussion, key informant semi structured interviews and unstructured in-depth interviews are used for data collection (Kothari, 2004). Quantitative researches as a formal, objective, systematic process are used to describe and test relationships and examine cause and effect interactions among variables. Surveys may be used for exploratory research. A survey is used to collect original data for describing a population too large to observe directly (Kothari, 2004). A survey obtains data from a sample of the population and infers that the population had the same characteristics as that of the population.

Again according to Creswell (2013), there are three research approaches: qualitative, quantitative, and mixed methods. Mixed research methods are used when it incorporates elements of both qualitative and quantitative approaches and the findings are also more reliable using one of the approaches. Mixed research design is an approach to inquiry involving collecting both quantitative and qualitative data, integrating the two forms of data, and using distinct designs that may involve philosophical assumptions and theoretical frameworks. The core assumption of this form of inquiry is that the combination of qualitative and quantitative

approaches provides a more complete understanding of a research problem than either approach alone.

The most appropriate research design for this study is mixed research design. The researcher will collect quantitative data using self-administered questionnaires with five points Likert scale to be distributed personally to the subjects by the researcher to measure the perceived practice of supply chain performance practices in the case of Heineken Brewery Company. The researcher also design and use semi-structured interview questions to collect qualitative data from the first tier local suppliers, the Heineken brewery company and the first and second customers of the brewery company.

3.4. Population and sample

The population size of this study is 850 but among them 4 persons did not return the questioner paper to the researcher, that's way for of them did not included the research sample size. In this study, non-random sampling technique would be used to select subsidiaries of Heineken Brewery S.C located in Addis Ababa as the case company of this study. In non-probability (also known as purposive sampling) sampling technique, the researcher determines as to which subject of the population to be included in the research study. Since this study is a case study, the researcher apply purposive sampling (non-probability sampling technique) based on time and resource constraints. In this study, the major limitation is the non-generalize ability of the findings to the total population.

The target respondents within each subsidiary are managers whose responses are directly related to supply chain management practices from departments including sourcing, production, transportation, sales & marketing, distribution & channel management, warehouse & inventory management. In order to insure reliably of the findings additional respondents would be purposefully selected by the researcher from 3 local strategic suppliers, two distribution agents and ten retail outlets.

The sample size for estimating a population proportion is based on the calculation of sample size formula Kothari (2004) by using appropriate statistical formula. Formula used for Simple Random Sampling. Calculation of the sample size (n) for finite populations ($f < 0.05$), taking into account a 95% confidence level. The formula is:

The sample size for estimating a population proportion is determined by using appropriate statistical formula for finite population. The formula is: where,

n= sample size

z= the value of standard variety at a given confidence level and to be worked out from table showing area under normal curve.

p= sample proportion

q= 1-p

e = given precision rate or acceptable error =9.2%

When the population size is finite, the formula for sample size determination will be modified as under:

$$n = \frac{z^2.p.q.\ N}{e^2\ (N-1) + z^2.p.q}$$

N = population

From the table Z=95%=1.96

Presently the factory has 850 employees Ref; Heineken brewery HR Director. This number of employees found in Head office (Sarber) and factory at Kilinto

- $$n = \frac{z^2.p.q.\ N}{e^2\ (N-1)+ z^2.p.q} = \frac{1.96x1.96x0.5x0.5x850}{(0.092x0.092x(850-1))+(1.96x1.96x0.5x0.5)}$$

$$n = 100$$

Sample Size = **100**

3.5. Sampling Technique

In this study, non-random sampling technique was used to select Heineken Brewery located in Addis Ababa as the case companies of this study. In non-probability (also known as purposive sampling) sampling technique, the researched determines as to which subject of the population to be included in the research study. Since this study is a multiple case study, the researcher applied purposive sampling (non-probability sampling technique) based on time and resource constraints. In this study the major limitation is the non-generalize ability of the findings to the total population.

3.6. Data Source and Data Collection Instrument

The type of data to be used for this study is primary data which would be collected by the researcher directly from the respondents for the specific purpose of addressing the research problem. The data to be used for this study are primary qualitative and quantitative data from the respondents using five point Likert scale questionnaires and semi-structured interview questions be designed by the researcher for self-administration. The questionnaires need to be designed based on the conceptual framework and the research questions to investigate and analyses the practice of supply chain performance in the case brewery company under consideration.

3.7. Data Analysis Method

The method of data processing in this study was computerized system. The row data that have been collected was processed and analyzed. For data analysis variance or standard deviation, and cross-tabulations or "crosstabs" is appropriate. The researcher prefers statistical method of data analysis. Information obtained from respondents was analyzed and interpreted with the help of SPSS 20 Software.

3.8 .Reliability and Validity

Cronbachs alpha is a coefficient of reliability. It is commonly used as a measure of the internal consistency or reliability of a psychometric test score for a sample of examinees. According to Bryma and Bell (2003), the Cronbach's Alpha result of 0.7 and above implies acceptable level of internal reliability. To meet consistency reliability of the instrument, the questionnaires was

distributed to 16 individuals who are workers of Heineken Brewery and Cronbach's alpha was found to be 0.869; which is above 0.7 in table 2. Therefore, the reliability of the whole items is reliable and acceptable.

Validity is the extent to which the research findings accurately represent what is really happening in the situation (Hussey and Hussey, 1997). That is, when we are developing a measuring instrument with the hope we are tapping a concept, how can we be reasonably sure that we are indeed measuring the concept we set out to do and not something else (Sekaran, 2003). Validity refers to the extent to which a test measures what we actually wish to measure.

Table 4 Reliability Statistics

Reliability Statistics

Cronbach's Alpha	N of Items
.904	44

3.9. Ethical Considerations

Ethics is becoming an increasingly prominent issue for all researchers. Researchers are encouraged to employ knowledge of research ethics in practice. Ethical issues are prominent throughout this research process, including during the data collection, during the analysis and writing up of the final report.

The researcher will clarify to the respondents about the objectives of the study and explain that the information would be used only for research and academic purposes. During conducting data collection, both honesty and respect for the rights of the respondents would be in place. Again, the researcher respects the rights to anonymity, confidentiality and informs consent of the respondents. The researcher also requests the consent of the respondents to conduct the research study with official letter to get final permission.

CHAPTER FOUR

Results, Discussion & Interpretation

Introduction

In this study the quantitative data analysis was done using descriptive statistics to compute mean and standard deviation using a statistical tool known as SPSS version 20. The finding of each variable has been presented using tables. The qualitative data collected from the case breweries, local suppliers, distributors and retail outlets were used to further explain and get in-depth insight about the findings of the quantitative data. Moreover, the findings of the qualitative data have been summarized using a table.

4.1 Respondents' demography

Table 4 Respondents' profile in the case of Heineken brewery companies

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

S/N	Respondent's Position	Respondent's Experience	Respondent's Qualification
1	Import Manager	5-10 YEARS	B.A / B.SC
2	Deputy Sales Director	ABOVE 10 YEARS	M.A / MBA
3	Sourcing Manager	2-5YEARS	B.A / B.SC
4	Transport Manager	5-10 YEARS	B.A / B.SC
5	SC Customer Service Expert	5-10 YEARS	B.A / B.SC
6	Distribution Manager	5-10 YEARS	B.A / BSC
7	Production Manager	ABOVE 10 YEARS	MA / MBA
8	Planning Division Manager	2-5 YEARS	B.A/B.SC
9	Deputy Planning Division Head	5-10 YEARS	B.A/B.SC
10	Import Manager	ABOVE 10YEARS	MA/MBA

In term of age 40.2% were above the age of 40 years. This category is followed by the age group 27 – 32, into which 28% of the respondents', 17.4% was between the ages of 33 and 39 years, 14.4% was between the ages of 20 and 26 years. In term of gender 62.1% was male, 37.9% female respondents. In term of Qualification 48.5% of respondents of the sample has Less than or=10+2. This is followed by respondents with a BA/BSc degree 27.3% and those with a college diploma or 12+3constitute 22%. 2.3% respondent indicate he/she has master's degree or above graduate.In terms of Service year 56.8% have worked for their organization for more than 5 years, while 21.2% have worked for their organization for 1-3years. 15.2 %, of the respondents have worked for their organization below 1 year, 6.8% have worked for the organization between 3 and 5years.

The analysis of the items from Likert's scale revealed that employees Agree/strongly agree with majority of items.

4.2 Quantitative data analysis

Considering the existing supply chain management experiences, respondents were asked to indicate the level of their agreement about supply chain management related to their respective companies from the alternative questions arranged in five point Likert scale method, where 1 stands for strong disagreement (the worst performance) and where 5 stands for strong agreement (the best performance). For the purpose of the analysis three (average) was used as a cut-off point. Where, more than three is considered as better level of performance while less than three was considered as low level of performance which needs improvement and management concern. In addition, three (average level) was also considered by the researcher as an indication of the area where improvement action plan and attention is needed. Mean performance score 4.0 and above are considered by the researcher to be high level of performance.

Table 5 SUMMARIES OF RESULTS INTEGRATION AND COLLABORATION WITH SUPPLIERS

1= strongly disagree 2= disagree 3= Neutral 4= Agree 5= Strongly agree

Supplier's Integration & Collaboration Performance N= 100.	1	2	3	4	5	Mean	Std. Deviation
Have a long term framework agreement with key strategic suppliers	0	0	0	60	40	4.40	0.492
Encouraging and developing the capacity of local strategic suppliers	0	0	20	80	0	3.80	0.402
Sharing long term production and raw material requirement plans with our key strategic suppliers	0	0	20	80	0	3.80	0.402
Joint forecasting of demand and planning inventory with our key suppliers	1	58	41	0	0	2.40	0.512
Trust key suppliers to share supply chain information.	0	0	20	80	0	3.80	0.402

As indicated in the above Table 5, 80% of the mean performance score is above 3.0 which is considered high level of performance and only 20% of the mean score is below 3.0 which is low level of performance. The case Heineken brewery companies work with their strategic suppliers based on contractual agreements. The result also indicates limited effort of the Heniken brewery companies in area sharing of long term material requirement plans and joint planning of inventory with suppliers. The level of trust between the suppliers and the Heineken brewery companies is considered low.

The findings from the semi structured interview further elaborated that even though there is contractual agreement between the strategic suppliers (E.g. Raw Malt Barley Suppliers) and the brewery companies, it was not enforceable and side selling of the barely grain was common for higher prices. The brewery companies also usually share short term plans of material needs and rare joint planning of inventories due to the fear for their competitors as they share same suppliers locally and abroad. Related to local suppliers' capacity development is very limited to providing technical expertise for quality control, financial and technical support to raw malt barley supplier (farmers) and advance payment to the factories. Local strategic suppliers like

Assela Malt Factory and Addis Glass Factory are not able satisfy the needs of the Heineken brewery companies due to capacity limitation that can be expanded.

There is limited effort of establishing partnership agreement and financing their production expansion instead of looking at foreign suppliers with limited hard currency reserve in the country.

Table 6. INTEGRATION AND COLLABORATION WITH STRATEGIC CUSTOMERS.

1= strongly disagree 2= disagree 3= Neutral 4= Agree 5= Strongly agree

Supplier's Integration & Collaboration Performance N= 100	1	2	3	4	5	Mean	Std. Dev
Trusting key strategic customers to share supply chain Information.	0	0	0	70	30	4.30	0.461
Involving key customers (distributors) in demand forecasting Process.	0	2	15	54	29	4.10	0.718
Involving key customers (retailers) in demand forecasting Process.	34	62	4	0	0	1.70	0.541
Integrate with key customers (Retail outlets) in inventory carrying decision	0	80	20	0	0	2.20	0.402
Integrate with key customers(distributors) in inventory carrying decision	0	0	0	40	60	4.60	0.492
Sharing real time inventory information for automatic Replenishment.	0	71	28	1	0	2.30	0.482

According to the above Table 6, 50% of the mean performance score is above

4.0 which is considered high level performance and the remaining 50% of the mean performance score is below 3.0 which is considered low level of performance. According to the data in the table above, the level of performance in relation to trust the Heineken brewery companies, involving distributors in demand forecasting and inventory carrying decision is high, and the level of performance related to involving retail outlets in demand forecasting, inventory carrying decision and real time inventory information sharing with retailers is considered low.

Moreover, the data collected from semi structured interview also reaffirms the above result. The Heineken brewery companies work closely with distribution agents in terms of sharing inventory and other supply chain information. Distributors provide their inventory status report to the Heineken brewery companies on daily basis. But neither the Heineken brewery companies nor the distributors collects inventory report on daily level in order to have accurate finished product inventory level in all the downstream supply chain partners. The sales forces of the Heineken brewery companies visits the retailers in their respective territories to the problems and challenges the retail outlets have, to roughly visit the inventory of their products in the refrigerator and rarely in their storages, checks how much each outlet purchases and reports. The link between the distributors and the retail outlets is loose except asking for their need and delivery. In relation to demand forecasting, the Heineken brewery companies do their demand forecast mainly based on the sales record to the distributors and the sales to the outlets but not the sales data of the retailers to the final customers. Therefore, the collaboration of the Heineken brewery companies and the distributors is better companies and the retail outlets.

The trust among the downstream supply chain partners appear to be limited. The manufacturers do not share their annual sales or demand forecast to their distribution channel partners. They simply set target for each distributor and force them to meet those targets set. Neither the distributors nor the retailers do their own sales / demand forecast and share with the Heineken brewery companies. This indicates low level of trust and collaboration and integration between the Heineken brewery companies and the distribution channel members.

Table 7. SUPPLY CHAIN RELIABILITY

1= strongly disagree 2= disagree 3= Neutral 4= Agree 5= Strongly agree

Supply Chain Reliability Performance Indicators N= 100	1	2	3	4	5	Mean	Std. Dev.
The brewery company always meet delivery committed date to customers (Distributors).	0	0	0	20	80	4.80	0.402
The distributors always meet delivery committed/promised Date to customers (retail outlet).	0	0	0	40	60	4.60	0.492
Strategic suppliers meet delivery lead time /delivery Schedule with the required standard.	34	62	4	0	0	1.70	0.541
The brewery companies always deliver customer orders at Accurate locations.	0	0	0	40	60	4.60	0.492
Customer orders are fulfilled accurately in terms of quantity and type of product.	0	0	0	60	40	4.40	0.492

According to the data in the Table 7 above, 80% of the mean reliability performance score is above 4.0 which is high level of performance and only 20% of the mean performance score is below 3.0 which is low level of performance. The data above depicts that the downstream supply chain is more reliable than the upstream supply chain reliability. The qualitative data collected using semi structured interview also indicate that the downstream supply chain partners work very hard to avail their products at each retail outlets at the right time and right location regardless of cost of distribution. The upstream supply chain is less reliable due to several reasons. The strategic local suppliers of brewery companies in Ethiopia, including Assela Malt Factory, Addis Ababa Bottle and Glass Factory, Cork Factory, are single source and also supply to all the beverage industry in Ethiopia. Consequently, they do not perform their contractual agreement in terms of quantity and time agreed due to lack of capacity and unable to expand their production capacity in line with ever increasing demand of the brewery companies as the industry is at growth stage. As a result, the brewery companies look at the foreign suppliers. The brewery companies import Malts, for instance, from European countries like France, Belgium and Netherlands. The souring process from foreign suppliers is does not meet the delivery schedule and hence one respondent mentioned that his company rarely experienced stock outs of raw materials. The reasons for less reliability of souring from foreign suppliers include

variability in hard currency/letter of credit permit from bands, long distance transportation schedule and finalizing customs formality at different stages. The brewery companies filling this gap by holding raw material inventories of up to 6 (six) months to remain being reliable regardless of costs.

Table 8 SUPPLY CHAIN RESPONSIVENESS

1= strongly disagree 2= disagree 3= Neutral 4= Agree 5= Strongly agree

Supply Chain Responsiveness Performance Indicators N= 100	1	2	3	4	5	Mean	Std. Dev.
The company has short raw material sourcing cycle time	34	62	4	0	0	1.70	0.541
The company has short products deliveries cycle time	0	0	0	20	80	4.80	0.402
The company has short production cycle time	0	0	0	50	50	4.50	0.503
The company has short packaging and sorting cycle time	0	0	0	50	50	4.50	0.503
The brewery company holds forecasted finished product inventory to quickly respond to demand fluctuation.	0	24	22	54	0	3.30	0.835

According to the data in the Table 8 above, 60% of the responsiveness performance score is above 4.0 and still 20 % is above 3.0 and 80% of the responsiveness performance is considered high level and the remaining 20% of the mean responsiveness performance is below 2.0 which is low level. The data again shows that raw material sourcing cycle time is long which means that the upstream supply chain is less responsive than the downstream supply chain.

The qualitative data the researcher collected using semi-structured interview questions explain the reason for high standard deviation from the mean for the performance indicator ‘holding forecasted finished product inventory that Brewery Company A holds inventory at the central warehouse at Addis Ababa production site from different manufacturing plants and at regional warehouse at different locations to respond to demand fluctuations and to be more responsive, whereas, the Brewery Company B does not hold finished product inventory to respond to demand fluctuations at Addis Ababa warehouse. As the demand in Addis Ababa exceeds its full

production capacity in Addis Ababa, it satisfies this demand in Addis Ababa by transporting from other manufacturing plants directly to distributors. It has no regional warehouses to respond to the demand fluctuations.

Besides, due to the fact that about 60-70% of the demand for Malt is satisfied from foreign suppliers, it is a long process that takes about 4-6 months of lead time which is long souring cycle time. Even in the case of the local suppliers, sourcing cycle time can be considered long as the breweries wait until AMF supplies based on the quota allocated to the breweries and the turns comes. AMF also sources all the raw malt barley grain from abroad (Birr 44 **Mln** or $ 5Mln per annum) due to malt barley shortage both in quality and quantity. All of these affect the responsiveness of the suppliers and sourcing.

Table 9 SUPPLY CHAIN INVENTORY MANAGEMENT PERFORMANCE.

1= strongly disagree 2= disagree 3= Neutral 4= Agree 5= Strongly agree

Inventory Management Performance Indicators N= 100	1	2	3	4	5	Mean	Std. Dev.
The brewery company set Standard Inventory Replenishment Reorder level as well as Min/Max Inventory Policy	29	62	9	0	0	1.8	0.586
The brewery company implement Collaborative Planning, Forecasting and Replenishment (CPFR) approach with its partners	34	62	4	0	0	1.7	0.541
The brewery company implements Vendor Managed inventory (VMI) system.	34	62	4	0	0	1.7	0.541
The brewery companies coordinate and manage inventories with all the supply chain partners.	24	62	14	0	0	1.9	0.611
The brewery company implemented automated warehouse and inventory management system that facilitate coordination regional warehouses	0	39	22	39	0	3	0.888
The brewery company implements Just-in-time (JIT) delivery Arrangements.	84	12	4	0	0	1.2	0.492
The brewery company jointly manage raw material inventory With strategic suppliers.	44	52	4	0	0	1.6	0.569
The brewery company jointly manage inventory with customers (Distributors).	0	0	9	42	49	4.4	0.651
The brewery company jointly manage inventory with customers(retail outlets)	44	52	4	0	0	1.6	0.569
The brewery company has centrally coordinated regional Distribution centers for product distribution.	0	53	14	33	0	2.8	0.910

According to the data in table 9 above, 80% of the mean inventory management performance score is below 3.0 which is low level of performance. Only 20% of the mean inventory management performance is above 3.0 which is high level of performance. Generally, the inventory management performance score was considered low. The standard deviation from the mean is high for the inventory management performance indicators of having automated inventory management and having centrally coordinated regional distribution centers due the difference in inventory management practices between the two breweries.

The qualitative data collected from semi structured interview indicate less practice of managing inventory jointly with suppliers and customers, especially with retailers. The breweries better work with distribution agents by receiving their inventory levels on daily basis, no more no less. Collaboration with retail outlets in managing inventory is minimal. Generally, Collaborative Planning, Forecasting and Replenishment (CPFR) approach with the upstream and downstream supply chain partners is a comprehensive collaborative strategy with the distribution channel partners and its practicality is minimal in the case supply chain management practices. In the case supply chain management practice, neither the distributor nor the retailer does demand forecast to share with the manufacturer (the brewery companies) to come up with shared single demand forecast for the products. The demand/sales forecast is done predominantly by the breweries and assign quota to the distribution agent to push the products to distribute and their performance is measured based on the target set.

Therefore, the practicality of collaborative forecasting, planning and replenishment is minimal in the case supply chain management practices.

Vendor Managed Inventory (VMI) agreement between the brewery company/distributors and the retailers does not exist. Vendor Managed Inventory (VMI) is a collaboration strategy between the supplier (the brewery companies) and the customer (the distributors or retailer) in managing and sharing information on sales and inventory level. In a VMI agreement, the suppliers is authorized and take responsibility to have access for real time the inventory level and making inventory replenishment decisions for their customers based on accurate and timely sales and inventory level information shared with the supplier. In the case supply chain management practices, the customers do not share their demand or sales forecast ahead of time with the suppliers and the brewery companies also do not replenish the finished product inventory level of

their customers automatically without receiving orders from them. The manufacturers even do not fulfil the customer orders unless payment is made and hence there are incidents of being stock outs at the retail stores due to financial capacities of very few distributors, of course. Therefore, VMI is less implemented in the case supply chain performance.

Just-In-Time (JIT) delivery is totally impractical at all the stages of the case supply chains due to several reasons so that the companies in the chain hold inventories.

Moreover, the inventory management tools like setting and implementing standard minimum and maximum inventory levels to held, reorder inventory levels, the economic order quantity for replenishment of inventories, safety stocks for finished products is also minimal in not only in the brewery companies but also in the distribution agents and retail outlets. The distributors and the retailers hold inventory for a period of 2 to 3 days consumption not even based on undertaking time series demand analysis. Due to ever increasing demand of beer in the market, the manufacturers are also holding few or limited inventory. This inventory management practice is prone to the risk of stock outs if the current 24/7 production is interrupted for even a day or a couple of days. Generally, unable to setting the aforementioned inventory management tools will ultimately result in holding overstock or under stock and both are unhealthy.

Table 10. SUPPLY CHAIN AGILITY (FLEXIBILITY &ADAPTABILITY)

1= strongly disagree 2= disagree 3= Neutral 4= Agree 5= Strongly agree

Supply Chain Agility Performance Indicators N= 100	1	2	3	4	5	Mean	Std. Dev.
Suppliers are flexible to accommodate a 25%increase /decrease in raw material demand change above the forecasted quantity.	73	15	11	1	0	1.4	0.725
The brewery company is flexible in production facility to accommodate a 25% increase/decrease in demand of finished products from the forecasted quantity.	0	13	0	41	46	4.2	0.974
The brewery company is flexible in delivery schedule to accommodate changes by 25% earlier/later than the Delivery schedule.	0	8	3	40	49	4.3	0.870
The brewery company's production is adaptable to meet extra demand of customers through overtime work or outsourcing, to produce more than the normal production and meet the unplanned need.	0	0	0	30	70	4.7	0.461
The brewery company rapidly adjusts its production capacity to address demand changes	0	0	0	50	50	4.5	0.503
Distributors adjusts transportation capacity to respond to small volume demands of customers	34	62	4	0	0	1.7	0.541

According to the data in the Table 10 above, 67 % of the mean supply chain agility performance is above 4.0 which is high and the remaining 33% is below 3.0 which is low. This shows that the suppliers' and distributors' flexibility and adaptability to respond to unplanned increase in demand is low. Whereas, the data indicates that the case brewery companies are flexible and adaptable to unplanned changes in production capacity and delivery schedule.

The qualitative data collected using semi structured interview indicate that distribution agents distribute the products to the retail out lets in Addis Ababa according to the territories assigned once a day in the morning using 5 ton trucks and release their drivers. When they receive call from few retailers for product deliveries in the afternoon may be in the afternoon, the distributor find it uneconomical to respond to small demands using big trucks and tell them to wait until the next day morning due to the fact that they are not using small trucks like 3 tons truck or 1 ton

pickup cars to be flexible and adaptable to the demand fluctuations. Especially the local strategic suppliers are less flexible/ adaptable to the changes in demand from the brewery companies from their plans due to the existing capacity limitation. However, the foreign suppliers have the capacity to accommodate unplanned changes in demand and hence they are flexible and adaptable to changes.

Table 11 SUPPLY CHAIN OPERATIONAL COST

1= strongly disagree 2= disagree 3= Neutral 4= Agree 5= Strongly agree

Supply Chain Cost Performance Indicators N= 100	1	2	3	4	5	Mean	Std. Deviation
Order fulfillment and management cost	29	62	9	0	0	1.8	0.586
Inventory carrying cost	26	62	8	4	0	1.9	0.704
Transportation and distribution cost	44	52	4	0	0	1.6	0.569
Defects and returns management cost	0	0	0	50	50	4.5	0.503
Sourcing cost	44	52	4	0	0	1.6	0.569
Material landed cost	54	42	4	0	0	1.5	0.577
Production (Labor , Machine) cost	34	62	4	0	0	1.7	0.541

The data above shows that the supply chain operational cost related to order fulfillment, inventory carrying, product distribution, souring and production is high and the cost associated with product defects and returns was considered low.

The qualitative data collected using semi structured interview indicated that the distribution/transportation management cost and order fulfillment cost is very high due to the fact that the plants are located at 6 locations and the distributors are disbursed throughout the country. And yet, breweries should deliver the products at the distributors' warehouse and their own central as well as regional warehouses.

The distributors also mobilize trucks every day for door to door delivery at the retail out lets without receiving prior orders received. As a result, the trucks go back to the distributors' store

or other sales points. Sourcing and inventory carrying cost was also considered high as most of the raw materials are imported and the lead time for import is varies from 4-6 months especially owing to shortage of foreign currency reserve in the country. During this period, the breweries carry raw material inventories, bottles packaging, and spares for maintenance of production machines in order to ensure uninterrupted production. This inventory carrying is also related to cost of tied up capital on the inventory. This indicates that cost of sourcing and inventory carrying are related and high. Production cost is high because the companies produce 24 hours a day without interruption and also use overtime labor force to fill the gap in demand fluctuation. The production machineries do not stop production for maintenance. The broken spare parts are removed and replaced by new once and this increases the cost of parts. Thus, the cost of production in relation with less production interruption was considered high.

4.3 Qualitative data analysis

In order to ensure the reliability of the findings of this study and to better explain the quantitative data, the researcher collected qualitative data from the supply chain related managers of the Heineken brewery, three local strategic suppliers (specifically, bottle factory, plastic crate factory and malt factory) and two distribution agents (one from each brewery in Addis Ababa) and ten retail outlets (one from each sub city) which are purposefully selected by the researcher for this study. The semi-structured interview questions are used to clarify and give more meaning to the quantitative result. It also enables to get in-depth insight about the performance of the supply chain Performance in the case of Heineken brewery.

4.4 Explanation of findings

In term of age 40.2% were above the age of 40 years. This category is followed by the age group 27 – 32, into which 28% of the respondents', 17.4% was between the ages of 33 and 39 years, 14.4% was between the ages of 20 and 26 years. In term of gender 62.1% was male, 37.9% female respondents. In term of Qualification 48.5% of respondents of the sample has Less than or=10+2. This is followed by respondents with a BA/BSc degree 27.3% and those with a college diploma or 12+3constitute 22%. 2.3% respondent indicate he/she has master's degree or above graduate. In terms of Service year 56.8% have worked for their organization for more than 5 years, while 21.2% have worked for their organization for 1-3years. 15.2 %, of the respondents

have worked for their organization below 1 year, 6.8% have worked for the organization between 3 and 5years.

The analysis of the items from Likert's scale revealed that employees Agree/strongly agree with majority of items. Moreover, most of the respondents agree that almost no involvement of suppliers in research and development activities on raw material supplies beyond planning to do so.

Brewery Company A provided financial support to farmers of malt barley grain with expert support to broaden the local supply base on contractual agreement even though the suppliers are not loyal and undertake side selling to other competitors at higher price. So, the integration and collaboration were not considered strong. Low level of joint planning and forecasting of raw material and packaging material inventories and product demand was identified. Breweries unilaterally plan demands and minimal level of sharing of long term demands and placing fragmented several orders within a year were identified. Local suppliers' capacity development and partnership arrangement is limited to advance payment and assigning experts to control the quality of inputs to be supplied. The reason for not sharing long term plans was for fear for leaking the information to their competitors as they share the same suppliers locally and abroad. But little of the respondents disagrees and strongly disagrees. In the case of involving key customers (retailers) in demand forecasting Process. The majority of respondents (34 %) strongly disagree, 62% disagree, 4%Neutral.

The level of involvement of distribution agents in demand forecasting was minimal and limited to sending inventory status once a day. The role of distribution agents in inventory carrying decision for the brewery companies were considered high. The level of involvement of retail out lets in demand forecasting and inventory carrying decision was minimal and no way or system to share the demands and the accurate inventory level of the retailers to be shared with their distributors or the breweries. The brewery companies distribute promotional free products via the distribution agents as part of the collaboration. The level of trust was there as on for not collaboratively planning, Forecasting and sharing data with the downstream partners.

The breweries meet the promised delivery date to deliver at the warehouses of the agents given payment is effected timely. The distributors transport the products to the doors of the retailers

without receiving prior orders on daily basis per allocated territories. However, there were retailers that were not visited due to demand fluctuations every day.

Due to long distance, shortage of foreign currency, customs clearance formalities and production capacity of the local suppliers the upstream supply chain was less reliable than the downstream supply chain in terms of meeting delivery schedule.

The sourcing cycle time of the breweries was long to import due to the fact that the capacity of the local suppliers was limited to satisfy the ever growing demands. The production cycle time, the packaging and sorting cycle time and delivery cycle time was short and hence it was more responsive delivery of products. The brewery companies hold input inventories up to 6 months including safety stocks due to long sourcing cycle time to ensure uninterrupted production. Brewery Company A holds finished product inventory at the central warehouse as well as at the regional warehouse to be more responsive. Whereas, Brewery Company B hold almost no inventory at the warehouses at production cites as it sells to the distributors which implies that this company was less responsive during demand fluctuation and machine Breakdown.

Local suppliers were less flexible to accommodate unplanned increase of quantity demanded than the foreign suppliers. So, local suppliers were less flexible.

The brewery companies were flexible in to accommodate unplanned increase/decrease of demand.

The brewery companies were flexible in delivery schedule to accommodate unplanned changes in the delivery schedule to deliver earlier or later. There was limitation with distribution agents to be flexible to transport small orders with small carrying capacity vehicles. Flexibility with warehouse capacity utilization was minimal in the cases of both the brewery companies and distributors as they use private warehouse and there was no public warehouse that results variable cost of holding inventory.

The supply chain operation cost was considered high. Order fulfillment and management cost was perceived high in relation with transportation.

Raw material inventory carrying cost was perceived high in terms of tied up capital, warehousing cost, labor cost. Transportation and distribution cost was perceived high. Sourcing and material

landed cost was perceived high as most of the major inputs, spares and packaging materials were imported and the cost increased due to fast transportation cost or holding high inventory with safety stock for long lead time. Production cost was considered high because to avoid production stoppage due to machine breakdown, replacement of machine parts by new ones were done instead of waiting until maintenance is done. Cost of defects, returns and reverse logistics was minimal.

Setting Standard Inventory Replenishment Reorder level as well as Min/Max inventory management tool was less practical. It is more applicable for raw material inventories than finished goods inventory. Collaborative Planning, Forecasting and Replenishment (CPFR) of inventory were less practical. Vendor Managed Inventory (VMI) was less practical. The inventory along the supply chain partners was less visible due to limited collaboration and information sharing. Automated warehouse and inventory management system and coordination between central warehouse and regional warehouses was practical with SAP system only with Brewery Company A. Just – In - Time Inventory was less practical. Joint inventory (raw material and finished goods) planning, forecasting and management with the supply chain partners Were less practical.

CHAPTER FIVE

Summary, Conclusion and Recommendation

5.1 Summary

Supply Chain performance sales out let has become an integral part of companies' business due to increased competition among companies. Supply chain performance excellence in terms of cost reduction, responsiveness, reliability, integration and collaboration with supply chain partners, inventory management effectiveness, efficiency, flexibility and customer service creates a competitive advantage to companies in the competitive business environment like the growing Heineken brewery industry in Ethiopia. The brewery industry in Ethiopia is at growth stage and it is highly completive among the existing operational Heineken brewery companies in the country. The researcher was interested in assessing and getting in-depth insight about the level of supply chain performance of Heineken Brewery Company located in Addis Ababa due to time and resource constraint. Heineken Brewery selected based on feasibility in terms of location, availability of data and their large market share in the country (it cover 80% according to the data.) to give better insight about the performance of supply chain in the Heineken brewery industry.

The researcher used quantitative and qualitative data for the study. The quantitative data was collected managers of supply chain related responsibilities using two point Likert scale and qualitative data were collected using semi structured interview questions from the same respondents as well as their three strategic suppliers in the country, two distributors and 10 retail outlets in order to triangulate the respondents to ensure the reliability of the findings of the study.

Based on the analysis of both qualitative and quantitative data, the researcher discovered the results as discussed variable by variable below. In this study seven supply chain performance variables (indicators) are used. The researcher finally came up with the following summary of findings.

The result indicated that 80% of the mean performance score related to integration and collaboration with suppliers is considered high level and the remaining 20% of the mean performance score is considered low level. 50% of the mean performance score related to integration and collaboration with customers in Heineken brewery is considered high level by the researcher and the remaining 50% of the mean performance score is considered low level. 80%

of the mean reliability performance score is considered high level and the remaining 20% of the mean performance score is considered low level. 80% of the mean responsiveness performance score is considered high level and the remaining 20% of the mean responsiveness performance was considered low. 80% of the mean inventory management performance score was considered low level and the remaining 20% of the mean inventory management performance was considered high. 67 % of the mean supply chain agility performance score considered high level and the remaining 33% of the mean supply chain agility performance score was considered low level. 86% of the mean supply chain cost performance score considered low level and the remaining 14% of the mean supply chain cost performance was considered high.

5.2 Conclusion

The integration and collaboration of the case Heineken brewery companies with strategic suppliers was generally considered good with limitations in terms of local supplier's capacity development, joint planning and forecasting as well as sharing of long terms demands due to less trust for fear of their competitors.

The integration and collaboration of the Heineken brewery companies with strategic customers was generally considered good with limitation in terms of jointly forecasting of demands, jointly planning of inventories and lack of visible supply chain inventory status along the downstream supply chain network.

The downstream supply chain was more reliable in terms of accuracy in quantity, place and time of delivery than the upstream supply chain. Suppliers are less reliable due to production capacity limitation (local) and long distance and involvement of several stake holders (Customs Authority, Banks, Transport Companies).

The Heineken brewery companies were flexible to manage unplanned demand fluctuations to certain extent. However, their local suppliers were less flexible to handle unplanned changes of demand due to capacity limitation. The distributors were also less flexible to handle small orders at any time of request.

Supply chain operation costs related to transportation, production, inventory carrying and sourcing are considered high.

Inventory management performance was considered low due to lack of automated inventory management practice, collaborative forecasting and planning of inventory with supply chain

partners, vender managed inventory system. As a result, there was less visible supply chain inventory along the chain due to lack of supply chain integration.

5.3 Recommendations

Based on the above findings and discussion held with employees and administrators the following recommendations are offered so as to gate better insight about the supply chain operations in the company.

- To improve reliability in the supply chain, companies are turning to transportation management. With rising transportation costs and undependable capacity, carrier connectivity provides an answer for improved performance, service, management, and reliability.
- To improve responsiveness of Heineken Brewery companies make use of a growing body of tools, techniques, and skills for coordinating and optimizing key processes, functions, and relationships, among its suppliers and customers, to enable and capture opportunities for synergy.
- The Heineken brewery companies should work closely with logistics companies to invest on public warehouses to ensure flexibility and cost reduction related to holding costs in private warehouses.
- Sourcing of inputs, packaging materials and spare parts etc. has long cycle time as procurement was from fore, in suppliers and production capacity limitation of the local suppliers, so the Heinclan Brewery company should minimizing costs and optimizing resources efficiently.
- Recommended to arrange partnership agreement to finance for the development of their production capacity asset Management.
- The researcher recommended Heineken Brewery to have automated inventory/ warehouse management system, ERP/SAP or equivalent as well as EDI to support the integration with different functions and efficient exchange of documents
- To overcome the major challenges of affecting the supply chain performance the searcher recommended that the Heineken brewery companies should work on import substitution to alleviate sourcing related costs and reduce inventory carrying cost by implementing collaborative planning, forecasting and replenishment with the supply chain partners.

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Appendix

Appendix A; Questionnaire

ADDIS ABABA UNIVERSITY SCHOOL OF BUSINESS & ECONOMICS GRADUATE STUDIES DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Dear respondents:

I'm a graduate student at Addis Ababa University School of Commerce in the Department of logistics and Supply Chain Management. Currently, I'm conducting a research entitled '**'your title of study''** as a partial requirement for the award of Masters of Art Degree in Logistics and Supply Chain Management. The purpose of this questionnaire is to gather data for the proposed study, and hence you are kindly requested to assist the successful completion of the study by providing the necessary information as per the questionnaires' given in all two sections. Your participation is entirely voluntary and the questionnaire doesn't require to write your names. The information you share will remain confidential and only used for the aforementioned academic purpose, thus not affects any one rather it might provide you in improving the efficiency and effectiveness of your company warehousing practices. So, your clear and timely response is vital for the success of the study.

I would like to thank you in advance for your kind cooperation and dedication of your precious time to fill up and return back to me this questionnaire form.

Best Regards,

SECTION-1 RESPONDENT'S PROFILE

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

1.1 Respondent's current position in the company	1.2 Respondent's qualification level:
Chain Manager □ Deputy Marketing Manager □ Production Manager □ Deputy Production Manager □ Distribution Manager □Transport Manager □ Warehouse & Inventory Manager □ Warehouse & Inventory Officers □ Sourcing Manager Procurement Manager □ Category Manager □ Import Manager □ Deputy Production Manager	Age Diploma Holder □ B.A/B.Sc. Degree Masters & Above 1.3 Respondent's work experience Below 2 years 2-5 years 5-10 years □ Above 10 years
□ Operations Production Manager □ Officers □ Inventory Controller □ Any other, please write here	

SECTION 2: PERFORMANCE OF SUPPLY CHAIN

The following questions are about how your organization has been implementing supply chain Performance. Please indicate the level of your agreement or disagreement using (□) on the following statements based on your experience in your company on the following supply chain performance. The rating is from 1= Strongly Disagree to 5=Strongly Agree as shown below.

2.1. INTEGRATION WITH SUPPLIERS (SSI)						
CODE	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
SSI1	Heineken Brewery Have a long term framework agreement with key strategic suppliers					
SSI2	Heineken Brewery Encourages and developed the capacity of local strategic suppliers					
SSI3	Heineken Brewery Sharing long term production and raw material requirement plans with its key strategic suppliers					
SSI4	Heineken Brewery Joint forecasting of demand and planning inventory with its key suppliers					
SSI5	Heineken Brewery Trusts key suppliers to share supply chain information.					
2.2. INTEGRATION WITH CUSTOMERS (SCI)						
CODE	Description	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
SCI1	Heineken Brewery Trusts key strategic customers to share supply chain Information.					
SCI2	Heineken Brewery Involves key customers (distributors) in demand forecasting Process.					
SCI3	Heineken Brewery Involves key customers (retailers) in demand forecasting Process.					
SCI4	Heineken Brewery Integrates with key customers (Retail outlets) in inventory					

	carrying decision					
SCI5	Heineken Brewery Integrates with key customers(distributors) in inventory carrying decision					
SCI6	Heineken Brewery Shares real time inventory information for automatic replenishment.					
2.3.SUPPLY CHAIN RELIABILITY(RL)						
CODE	DESCRIPTION	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
RL1	Heineken brewery always meet delivery committed/promised date to customers (Distributors).					
RL2	The distributors always meet delivery committed/promised date to customers (retail outlet).					
RL3	Strategic suppliers meet delivery lead time /delivery schedule with the required standard.					
RL4	Heineken Brewery always deliver customer orders at accurate Locations.					
RL5	Customer orders are fulfilled accurately in terms of quantity and type of product by Heineken Brewery.					
2.4 SUPPLY CHAIN RESPONSIVENESS (RS)						
CODE	DESCRIPTION	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
RS1	The company has short raw material sourcing cycle time					
RS2	The company has short products delivery cycle time					

RS3	The company has short production cycle time					
RS4	The company has short packaging and sorting cycle time					
RS5	Heineken Brewery holds forecasted finished product Inventory to quickly respond to demand fluctuation.					
2.5 SUPPLY CHAIN AGILITY (FLEXIBILITY & ADAPTEBILITY (AGL)						
CODE	DESCRIPTION	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
AGL 1	Heineken Brewery is flexible to accommodate a 25% increase /decrease in demand change above the forecasted quantity.					
AGL 2	Heineken Brewery is flexible in production facility to accommodate a 25% increase/decrease in demand of finished Products from the forecasted quantity.					
AGL 3	Heineken Brewery is flexible in delivery schedule to accommodate changes by 25% earlier/later than the delivery schedule.					
AGL 4	Heineken brewery production is adaptable to meet extra demand of customers through overtime work or outsourcing, to produce more than the normal production and meet the unplanned need.					
AGL 5	Heineken Brewery rapidly adjusts its production capacity to address demand changes					
AGL6	Heineken Brewery product Distributors					

	adjusts transportation capacity to respond to small volume demands of customers					

2.6 SUPPLY CHAIN COST PERFORMANCE(COS)

Please indicate the level of supply chain operation cost with the rating :

1=Very Low up to 5= Very High

CODE	DESCRIPTION	Very Low	Low	Neutral	High	Very High
		1	2	3	4	5
COS1	Order fulfillment and management cost of Heineken Brewery					
COS2	Inventory carrying cost of Heineken Brewery					
COS3	Transportation and distribution cost of Heineken Brewery					
COS4	Defects and returns management cost of Heineken Brewery					
COS5	Sourcing cost of Heineken Brewery					
COS6	Material landed cost of Heineken Brewery					
COS7	Production (Labor , Machine) cost of Heineken Brewery					

2.7 INVENTORY PERFORMANCE (INV) (Asset Management)

CODE	DESCRIPTION	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
		1	2	3	4	5
INV1	Heineken brewery set Standard Inventory replenishment, Reorder level as well as Min/Max Inventory Policy					
INV2	Heineken brewery implement Collaborative Planning, Forecasting and Replenishment (CPFR) approach with its partners					
INV3	Heineken brewery implements Vendor Managed Inventory (VMI) system.					
INV4	Heineken brewery coordinates and manages inventories with all the supply chain partners.					

INV5	Heineken brewery implemented automated warehouse and inventory management system that facilitate coordination regional warehouses					
INV6	Heineken brewery implements Just-in-time (JIT) delivery arrangements.					
INV 7	Heineken brewery jointly manage raw material inventory with strategic suppliers.					
INV8	Heineken brewery jointly manage inventory with customers (Distributors).					
INV9	Heineken brewery jointly manage inventory with customers (retail outlets)					
INV10	Heineken brewery has centrally coordinated regional distribution centers for product distribution					

Appendix B: Interview Questions to Heineken Brewery Company Managers

1. Please explain the following complementary semi structured questions. Please tell me about your company and what do you supply to the case brewery companies?
2. How do you evaluate the level of your relationship, collaboration and integration with your suppliers, local and foreign?
3. Please explain the areas of collaboration with your distributors and retailers as a supply chain member?
4. How do you explain the supply chain performance in terms of reliability, responsiveness, flexibility, operational cost?
5. What is the level of ICT utilization in the supply chain and communication with your partners?
6. How do you evaluate the cost of supply chain operation?
7. Please tell me about the inventory warehouse management process?
8. What is the level of involvement of your customers and suppliers in joint planning, forecasting and sharing supply chain information?

Appendix C: Interview Questions to Suppliers

1. Does your company jointly forecast plan future demands of the case Heineken brewery companies? Please explain briefly
2. Does the case Heineken Brewery Company's share their long term needs to manage inventory jointly you as a supplier? Please explain briefly
3. How do evaluate the collaboration and integration effort of the case Heineken brewery companies in terms of capacity development, involvement in research activities, quality control, etc? Please explain briefly
4. Do you satisfy the demands of the case brewery companies in terms of quality and quantity? Please explain briefly
5. Do you have the capacity to accommodate unplanned demand changes? How, please explain?
6. Does your company deliver orders on time with the right quantity and quality?
7. If you have anything to add please?

Appendix D: Interview Questions to Distribution agent

Please answer the following complementary questions. Thank you for participation.

1. Please tell me about the level of collaboration and partnership with the Heineken brewery companies and the retailers
2. Are you involved in the market research activities with the Heineken brewery company?
3. Are you involved in joint forecasting and planning of demands with the brewery company?
4. What is the level of flexibility of the Heineken brewery company in case of demand fluctuation or unplanned change of demand?
5. Does the Heineken brewery company hold inventory to quickly respond to demand fluctuation?
6. Does your company hold inventory based on standard Min /Max and ROL?
7. Does the Heineken brewery company deliver products to your warehouse on time?
8. Does your company deliver products to your retail outlets on time and with adequate flexibility?
9. Do you receive order from different customers prior to shipment?
10. Does the Heineken brewery company automatically replenish your stock or is it based on your order?
11. Do you share inventory status among the Heineken brewery company, the retailers and your company?
12. Do you have anything to add?

Appendix E: Interview Questions to Retail Outlets

Thank you for your collaboration to participate in this interview. Kindly answer the following question based on the case brewery companies I mentioned to you.

1. How frequently do the market promoters or MR visit you?
2. What do they do when they come?
3. Do you report your inventory status? If Yes, to whom?
4. Do you do demand forecast and inventory planning? If yes, do you share it? To whom?
5. What do you do with the distributors and the brewery companies jointly?