ADDIS ABABA UNIVERSITY
SCHOOL OF COMMERCE
DEPARTMENT LOGISTIC AND SUPPLY CHAIN MANAGEMENT

THE EFFECT OF SUPPLY CHAIN COLLABORATION ON OPERATIONAL PERFORMANCE: THE CASE OF HEINEKEN BREWERIEE SC., ADDIS ABABA, ETHIOPIA.

BY:

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A THESIS SUBMITTED TO Addis Ababa UNIVERSITY SCHOOL OF COMMERCE IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF ARTS IN LOGISTICS AND SUPPLY CHAIN MANAGEMENT

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JUNE 2022
ADDIS ABABA, ETHIOPIA

ADDIS ABABA UNIVERSITY SCHOOL OF COMMERCE

This is to Confirm that Shawel Assfaw Yosef's thesis, entitled: "The Effect of Supply Chain Collaboration on Operational Performance: The case of Heineken Brewery Share Company" was submitted for partial fulfillment of the requirements of degree of Master of Arts in Logistics and Supply Chain Management complies with the regulations of the University and meets the accepted standards concerning originality and quality.

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DECLARATION

I, the undersigned, declare that this thesis entitled “The Effect of Supply Chain Collaboration on Operational Performance: The case of Heineken Brewery Share Company” is my research and it has not been submitted for a degree requirement at any other university, and all sources used to support this particular study have been appropriately acknowledged.

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CONFIRMATION

This is to confirm that Shawel Assfaw Yosef has completed the research work titled "The Effect of Supply Chain Collaboration on Operational Performance: The case of Heinken Brewery Share Company" for the partial fulfillment of Master of Arts in Logistics and Supply Chain Management at Addis Ababa University, School of Commerce. This study is an original work and not submitted earlier for any degree either at this University or any other University and is suitable for submission of master's degree in Logistics and Supply Management

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Advisor: Zelalem Bayisa (Dr.)

ACKNOWLEDGEMENTS

For the research to take the current form, many people have contributed significantly and provided invaluable support, encouragement, and constructive criticism. Above all, I am grateful to God for his love, protection, provision of knowledge, wisdom, inspiration, and diligence necessary to complete this thesis.

This thesis would not have been accomplished without the help of certain people to who I owe my gratitude. I want to express my gratitude to Dr. Zelalem Bayisa, my adviser, for his insightful ideas and constructive comments on the research's substance, structure, and preparation. Dr. Terefe Zeleke for the support he gave me on SPSS analysis. I also want to give my gratitude to Ato Tarekegn Garomsa and Alemseged Teklemariam an employee of Heineken brewery to their invaluable support in collecting data.

I am also grateful to the employees of Heineken Breweries for their support in devoting their precious time to filling the questionnaires and making this research possible.

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ABBREVIATIONS AND ACRONYMS

ANOVA - Analysis of Variance

EDI – Electronic Data Interchange

IS – Information System

IT – Information Technology

HLC – Horizontal Logistic Collaboration

JDM – Joint Decision Making

SCC – Supply Chain Collaboration

SCM – Supply Chain Management

SPSS - Statistical Package for Social Science

VIF - Variance Inflation Factor

ABSTRACT

The aim of this study was to examine the effect of supply chain collaboration on operational performance of the Heineken brewery S.C. To meet the objective, explanatory and descriptive research designs were used in this study. Consequently, data were collected from 91 randomly selected respondents from the total targeted population. The total target population for this study was constitute (N= 168) Managerial employees (ranked as MT, MT-1, MT-2, it is to mean senior management, middle level management and lower level management respectively) of different departments at the head office and branch offices of Heineken brewery. For the collection of data, the questionnaire that comprises both close-ended and open-ended questions was administered to the selected respondents. Concerning the quantitative data analysis, descriptive and inferential statistical results were executed with the help of SPSS version 25. Narrative explanation has been made for qualitative data collected with the use of open ended questions to triangulate the quantitative results. The result of the study revealed that the actual practice of the organization in three components of supply chain collaboration such as information sharing, decision synchronization and electronic data interchange was relatively at high level, while incentive alignment was found moderate. The study also revealed that the current operational performance level of the company was at high level. Furthermore, the study found that the three dimensions of supply chain collaboration such as Decision Synchronization, Incentive Alignment and Electronic Data interchange have statistically significant effect on Operational Performance of the business firm. Therefore, the management of the organization should give due consideration for the three components of supply chain collaboration to maintain and enhance the operational performance of the brewery S.C.

Keywords: *Supply chain collaboration, Information share, Decision synchronization, Incentive alignment, Operational performance, Practices, Brewery S.C*

CHAPTER ONE
INTRODUCTION

1.1. BACKGROUND OF THE STUDY

In today's competitive unpredicted business world, cost reduction and good customer services are not stand-alone effort of any single SC member. As success of any product lies in customers' response to that product, it is important for businesses to achieve customer satisfaction by having efficient and effective SCs. This may be possible through collaboration among SC partners (Usha, 2013).

In line with this, in the past few decades, there has been a need for firms to look outside their organizations for opportunities to collaborate with partners to ensure that the supply chain is efficient and responsive to dynamic market needs. Firms have strived to achieve greater supply chain collaboration to leverage the resources and knowledge of their suppliers and customers (Fawcett and Magnan, 2004; Lejeune and Yakova, 2005). Supply chain collaboration means two or more autonomous firms working jointly to plan and execute supply chain operations (Simatupang and Sridharan, 2002). It can deliver substantial benefits and advantages to its partners (Mentzer et al., 2000). Firms such as Hewlett–Packard, IBM, Dell, Procter & Gamble have forged long-term, collaborative relationships with their suppliers to reduce transaction costs and achieve a stronger competitive position (Handfield and Bechtel, 2002; Johnson and Sohi, 2003; Sheu et al., 2006). Collaborative relationships can help firms share risks (Kogut, 1988), access complementary resources (Park et al., 2004), reduce transaction costs and enhance productivity (Kalwani and Narayandas, 1995), and enhance profit performance and competitive advantage over time (Mentzer et al., 2000).

Firms integrating their information and material flow would lead to optimal management of the supply chain (Samaranayake, 2005). It involves the alignment of business functions internally within a firm and with its supply chain partners so as to reduce costs, increase customer value and overall performance across the supply chain for all partners (Stank et.al. 2001).

Finally, after realizing the national economic situation and present development in the breweries industry it can be concluded that effective supply chain is essential. However, to make the supply chain effective, efficient and achieve the best operational performance supply chain collaboration

need to be more improved. This study was empirically verify four supply chain collaboration approaches namely, information sharing, decision synchronization, electronic data interchange, and incentive alignment and revealed what effect does it has on operational performance of the case company.

1.1.1 BACKGROUND OF THE ORGANIZATION.

The Beer industry in Ethiopia has gone through tremendous growth in the last two decades. It transformed into one of the most competitive industries in Ethiopia with millions of birr spent on advertisements alone. The competitiveness of the industry has led to more investment the farming sector such as in malt production (Sisay Gessesse 2017).

In Ethiopia there are about twelve breweries owned by six companies, which produce different beer products and residues and supplying into the market through different approaches and strategies. The total installed annual production capacity is estimated to be 12 million hectoliters but there is no data on actual production. The list of brewery factory and respective main products are summarized in the table below:

Table1.1 List of beer producers in Ethiopia.

Name of the brewery company	***Factories owned***	***Product types***
BGI Ethiopia PLC	Addis Ababa, Kombolcha, Hawassa and Major shareholder in Raya and Zebidar Breweries	St. George, castle, Amber, and draft beer
Dashen Brewery S.CO	Gondar and Debre Birhan	Dashen beer and Draft beer
Diageo Meta Abo Brewery share company	Meta Abo Sebeta	Standard, premium draft beer, Malta Guinness
Habesha	Habesha in Debre Birhan	
Heineken	Harar, Bedele and Kilinto	Bedele regular, Bedele special, Harar beer, Hakim stout, Harar Sofi, Lemon, sofi Harar draft

(Source: *Mapping of spent brewers' grain supply chain in Ethiopia*: Dawud Mohammed, Degu Addis, Tinsae Berhanu and Adriaan Vernooij Wageningen, November, 2019)

Heineken was the next foreign player to enter the market, acquiring two breweries in 2011 and opening a third in 2014. Heineken is currently the top producer, with capacity of 5.6 million hectolitres a year.

1.2. STATEMENT OF THE PROBLEM

The recognition of the supply chain as a key and vital field for organizational success has been a major change and challenge, in the modus operandi (a method of procedure) of enterprises.

Their capacity to work with other businesses has frequently been directly correlated with their ability to compete. Many authors, including those cited in Matopoulos (2007) (Lewis, 1990; Lamming, 1993; Hines, 1994; Gattorna and Walters, 1996; Christopher, 1998; Gunasekaran et al., 2001) have acknowledged this increased need for collaboration, highlighting the creation of closer and long-term working relationships even partnerships with suppliers at various levels in the chain as a way to build ever more efficient and responsive supply chains in order to deliver exceptional value.

Even though the information and communication technology revolution and the development of e-business applications have more or less overcome previous communication restrictions regarding effective data and information exchanges between supply chain members, collaboration in the supply chain is not always simple to achieve. The series of dyadic business interactions that make up the supply chain may still be impacted by a number of factors connected to the business climate, unique industry characteristics, and endogenous firm characteristics, enabling or worsening collaboration opportunities.

Collaboration is becoming more of a requirement than an option, despite the obstacles that may make it worse for businesses in many global industries. Collaboration is about businesses and organizations working together, and it can be seen as a notion that goes beyond regular business ties. The responsibilities of the supplier and the buyer are no longer strictly defined in terms of the straightforward transfer of product ownership, which marks a shift from the anchor point of discreteness that underpins spot market transactions in favour of a relational exchange (Macneil, 1981).

However, there are few studies that look at the relationship between organizational performance and supply chain collaboration in Ethiopian food and beverage manufacturing enterprises. To close the knowledge gap and improve the performance of the industry, analytical and scientific research must be conducted.

Water, barley, malt barley, and hops have been used as the primary ingredients in all the factories to make beer and similar goods. Numerous research have shown that supply chain collaboration is a weak practice in many Ethiopian industries. Therefore, in the example of Heineken brewery, how organizations use supply chain collaboration to achieve the aforementioned results

In line with the above mentioned objectives the researcher was tried to address the following research questions.

1.3. RESEARCH QUESTIONS

The main purpose of this study is to answer the following basic research questions:

1) What are the Practice of Information sharing of Heineken Brewery Company with its suppliers and buyers?
2) How is the company's joint decision making practiced?
3) What is the practice of incentive alignment with its value chain partners?
4) How is the electronic data interchange practiced among the partners?
5) How SCC dimensions affect the operational performance of Heineken Brewery Company?

1.4. OBJECTIVES OF THE STUDY

1.4.1. General Objective

The major objective of this study is to evaluate the effect of supply chain collaboration on operational performance: in the case of selected (Heineken) breweries in Addis Ababa.

1.4.2. Specific Objectives

1) To evaluate the practice of Information sharing of Heineken Brewery Company with its suppliers and buyers
2) To examine the company's joint decision making practice
3) To identify the practice of incentive alignment with its value chain partners
4) To explore the electronic data interchange practiced among the partners
5) To evaluate how SCC dimensions affect the organization operational performance

1.5. SIGNIFICANCE OF THE STUDY

Ensuring a high level of collaboration practice with supply chain partners is one of the most important tasks of any manufacturing business organization. This study reviewed, analyzed, and evaluated the supply chain collaboration practice and organizational performance of Heineken Breweries S.C. Therefore, the researcher hopes that the findings and recommendations of this study will provide a framework for the adoption of sound SCC practices in Heineken breweries, which prove useful to other breweries within the Ethiopian beverage sector. Moreover, the study can give insight to researchers and students about the problem and stimulate further investigation for those who intend to research into related areas. Finally, the research may be used as a source of reference for other researchers who are interested to conduct further study related to this problem and other related studies.

1.6. SCOPE OF THE STUDY

The findings of this research would be fruitful if it were conduct by including all other breweries in Ethiopia. However, this study is only cover Heineken brewery particularly on the head office and some branches in the selecting metropolitan area of Addis Ababa. This company is preferred because as it has a very good supply chain collaboration in its origin country of Holland in its supply of many of its input for its product and as being it is one of the leading company among the breweries company.

In addition, this research is thematically cover only a specific supply chain collaboration (SCC) among Heineken brewery and the different partners in the supply chain.

1.7. LIMITATION OF THE STUDY.

This study was limited to Heineken brewery. Furthermore, the study was mainly focus on branches within Addis Ababa. The sample respondents was national staff from head quarter office and selected branches in Addis Ababa, who are working on different grades and functional areas, but holding managerial positions in logistics and supply chain management. The scope of this study is also limited to SCC practices of the organization. The study did not include other reginal branches and similar companies in the brewery industry.

1.8. ORGANIZATION OF THE STUDY

The study is organized in five chapters. The first chapter contains the introductory part of the paper which include statement of the problem, objective of the study, limitation of the study, scope of the study, significance of the study, and methodology of the study.

The second chapter contains conceptual literature which reviews some important concepts; such as introduction, the concepts of supply chain collaboration and related concepts in the variables under study. The third chapter discuss the research methodology part of the study. The fourth chapter dealt with the presentation, analysis and discussion of the data gathered. The last chapter concludes the results obtained from the research and tried to provide appropriate recommendations.

1.9. OPERATIONAL DEFINITION OF THE VARIABLE UNDER STUDY

- ***Collaboration*** in the supply chain context is a mutuality of benefit, rewards and risk sharing together with the exchange of information as a foundation of the collaboration (Stank et.al.,1999; Barratt and Oliveira, 2011)
- ***Operational performance*** is "A set of metrics used to quantify the efficiency and effectiveness of supply chain processes and relationships, spanning multiple organizational functions and multiple firms and enabling supply chain orchestration" (Mastering et al., 2017).
- ***Information Sharing*** is defined as "the willingness to make strategic and tactical data such as inventory levels, forecasts, sales promotion, strategies, and marketing strategies available to firms forming supply chain nodes" (Cao and Zhang, 2012).
- ***Joint Decision Making*** is defined as the "process by which supply chain partners coordinate activities in supply chain planning and operations for optimizing the supply chain benefits (Cao and Zhang, 2012)
- ***Electronic Data Interchange*** (EDI) and now the Internet have enabled partners in the supply chain to act upon the same data, at same time with minimum resources (Christopher, 2016).
- ***Incentive alignment*** refers to the process of sharing costs, risks, and benefits amongst the participating members (Simatupang and Sridharan, 2002).

CHAPTER TWO

REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION

The supply chain collaboration research that are pertinent to this study are summarized in this section. Collaboration in the supply chain is becoming more and more popular among academics and practitioners (Corbett et al., 1999; Horvath, 2001). Collaboration in the supply chain frequently referred to as two or more chain participants cooperating to build a competitive advantage through knowledge sharing, group decision-making, and benefit sharing. They are a result of fulfilling end-user wants being more profitable than acting alone (Simatupang and Sridharan, 2002). (Simatupang and Sridharan, 2002). According to Bowersox (1990), the adoption of Collaboration within the supply chain would increase as a result of globalization and computer technology. Narus and Anderson (1996) noted in a similar vein that Collaboration between supply chains becomes a key component in developing an adaptive supply chain.

In order to quantify relative levels of collaborative practices as well as internal levels of supply chain collaboration, an instrument is needed (Barratt and Oliveira, 2001; Simatupang and Sridharan, 2004). The chain members can identify the weaknesses of their existing levels and potential initiatives to address them by measuring internal levels of collaborative practices (Bowersox et al., 2000; Stewart, 1995). They can compare their current levels of practice to those of the greatest in their field according to the measurement (Simatupang and Sridharan, 2004). Additionally, by assessing supply chain collaboration, the chain members can determine the crucial practice that most significantly improves supply chain performance (Stewart, 1997).

Although supply chain collaboration is becoming more and more widespread, quantifying supply chain collaboration has received relatively little attention (Lambert and Pohlen, 2001; Simatupang and Sridharan, 2004). Previous studies have a tendency to suggest metrics to quantify how closely a company works with its supply chain partners. Stewart (1997) described the creation of the supply chain operations reference (SCOR) model as the first industry-spanning framework for assessing and enhancing the performance of extended supply chains. The SCOR model was used by Geary and Zonnenberg (2000) to demonstrate that the top achievers benefited significantly more financially and operationally than the other sampling groups.

At both the operational and strategic levels, Bowersox et al. (2000) established subjective metrics of supply chain competency. Ramdas and Spekman (2000) investigated the cooperative behaviors amongst high performers among supplier chains for innovative and functional products employing system-wide revenues and expenses.

Another line of research has attempted to use the maturity model of collaboration as a tool to gauge the extent to which supply chain collaboration is shifting from an internal to an inter-organizational focus. A progressive paradigm with four tiers of supply chain optimization was put forth by Poirier (1999). "Sourcing and logistics" and "internal excellence," the first two stages of development, are internally centered. The latter two tiers, "network creation" and "industry leadership," are a reflection of cooperative efforts made by participating members to enhance their value chains. The effectiveness of these value chains is determined by the purchases and steadfast allegiance of the final customers. Additionally, Polese (2002) created a maturity model that illustrates how businesses grow their operational capabilities. The essential component for achieving external integration and cross-enterprise collaboration is collaborative capacity. Poles (2002) asserts that the maturity model, which is based on the SCOR model, can be used to assess fact-based benchmarking for identifying chances for best-in-class performance.

Information sharing, decision synchronization, and incentive alignment are the three interrelated components that make up the concept of collaboration (Simatupang and Sridharan, 2004). Information sharing is the process of gathering and distributing timely, pertinent information to decision-makers so they can plan and manage supply chain activities. Joint decision-making in operational and planning contexts is referred to as decision synchronization. The planning context incorporates long-term planning choices and evaluates aspects including choosing target markets, product lineups, level of customer service, promotion, and forecasting. The operational context incorporates the processes for creating orders and delivering them, which may take the shape of shipping schedules and product replenishment in the retail stores.

2.2.THEORETICAL REVIEW OF SCC FOR PERFORMANCE

2.2.1. Theoretical Paradigms in the supply chain collaboration

Collaboration in the supply chain is based on the concept of collaborative advantage rather than competitive advantage (Kanter, 1994; Dyer, 2000). (Porter, 1985). The collaborative paradigm states that a supply chain is made up of a series or network of interdependent interactions that are cultivated through collaboration and strategic alliances (Chen and Paulraj, 2004). This perspective on shared competitive advantage is relational (Dyer and Singh, 1998). While competitive advantage promotes individual rent-seeking activities that maximize a firm's own profits, relational rents that provide common benefits for bidirectional rent-seeking behaviors are the source of collaborative advantage (Lavie, 2006).

Supply chain partners can perceive supply chain collaboration as a positive-sum game rather than a zero-sum game in which partners compete to take more relational rents for their own competitive benefit using the perspective of collaborative advantage. Multiple viewpoints are represented in the supply chain collaboration literature. In this study, four viewpoints—transaction cost economics, resource-based views, relational views, and extended resource-based views—are examined.

2.2.1.1. Transactional Cost Economics (TCE)

The highly influential theory of transaction cost economics (TCE) helps explain relationships between organizations (Williamson, 1975; Barringer and Harrison, 2000). Williamson (1975) distinguishes between markets and hierarchies as two types of organization. TCE claims that the choice between using market processes or vertical integration/hierarchies depends on the relative monitoring costs caused by constrained rationality as well as uncertainty brought on by partners' vested interests and opportunism (Kaufman et al., 2000).

The third option for organization that helps avoid the issues brought on by both hierarchies and markets is supply chain collaboration (Koh and Venkatraman, 1991). Through process integration and mutual trust, supply chain collaboration enables businesses to lower the costs of opportunism and monitoring that are inherent in market transactions, increasing the likelihood that partners will

act in the partnership's best interests (Croom, 2001). Collaboration throughout the supply chain also aids businesses in avoiding internalizing a task that might not be in line with their core skills.

2.2.1.2. Resource Based View (RBV)

A lot of emphasis is paid to the resource-based view (RBV) of the organization while attempting to understand supply chain collaboration. Resources, Capabilities, and Strategic Assets (RBV) are its core ideas (Barney, 1991). According to RBV, strategic resources including core competency (Prahalad and Hamel, 1990), dynamic capability (Teece et al., 1997), and absorptive capacity can explain variation in business performance (Cohen and Levinthal, 1990). Businesses that combine resources in novel ways may gain an advantage over rival businesses that are unable to do so (Dyer and Singh, 1998). Firms can achieve a prolonged market advantage by possessing limited resources and assets and excelling in their core strengths and capabilities (Knudsen, 2003). RBV asserts that because relation-specific assets are uncommon, valuable, non-replaceable, and difficult to mimic, investing in them helps partnered enterprises gain a competitive edge (Barney, 1991).

It is challenging for their competitors to copy the supply chain partnering enterprises' relational assets because of the ambiguity of the causal relationships and their embeddedness (Jap, 2001). Collaboration in the supply chain also enables businesses to concentrate on their distinctive core functions, which boost firm-specific talents and realize economies of scale and learning effects, enhancing their competitive positions (Park et al., 2004).

2.2.1.3. Relational View (RV)

The relational view (RV), which contends that vital resources may cross firm boundaries, complements the RBV (Dyer and Singh, 1998). In addition to internal rents, which include quasi-rents from added value and Ricardian rents from resource scarcity, firms can also generate relational rents. A relational rent is a supernormal profit produced jointly in an exchange relationship that cannot be produced independently by either firm and can only be produced by the combined efforts of the cooperative partners (Dyer and Singh, 1998; Lavie, 2006). When cooperative partners combine and trade unique assets, expertise, and capacities through relation-specific investments, inter-firm knowledge-sharing practices, complementary resource endowments, and efficient governance systems, relational rents are made available.

The relational approach, which elaborates on the mechanisms of cooperative value creation, is the foundation for collaborative advantage (i.e., inter-firm rent generation). It makes the case that relational rents develop at the level of collaboration for mutual gain. Contrary to research that highlight both private and shared advantages (Hamel, 1991; Khanna et al., 1998), the relational view places more emphasis on shared benefits that cooperative partners are unable to produce on their own.

2.2.1.4. Extended Resource Based View(ERBV)

Traditional RBV presupposes that businesses must totally control or own their resources in order to create value. According to the extended resource-based view (ERBV), enterprises can benefit from resources by having access to them, using them, or taking use of the benefits that come with them. By describing how connected firms in dyadic collaboration/alliance combine external resources and internal resource endowments to create a competitive advantage for the focal firm, Lavie (2006) expands the RBV. In an alliance or collaboration, a focus firm's competitive advantage, according to Lavie (2006), consists of four components: internal rent, appropriated relational rent, inbound spillover rent, and outbound spillover rent. The shared and non-shared resources owned by the focus enterprise can be used to extract internal rent. Only the resources that both partners share with each other can be used to extract appropriate relationship rent. Outbound spillover rent results from the transfer of benefits from the focal firm to the partner, whereas inbound spillover rent is the rent generated from the partner's shared and non-shared resources through knowledge leakage, inter-firm learning, relative absorptive capacity, and internalization of the partner's practices. For the focal firm, the sum of internal rent, inbound spillover rent, and outward spillover rent results in private benefits. Its private perks and appropriated relational rent are key components of its competitive advantage (i.e., appropriated common benefits).

Conversely, a collaborative partner's advantage results from a relational rent, a shared benefit, which is a joint competitive advantage (Dyer and Singh, 1998). Neither collaborating partner can provide this kind of rent on their own. In addition, by taking into account the unilateral accumulation of spillover rents that result in private advantages, Lavie's (2006) model expands on earlier studies on the generation of joint value in dyadic alliances.

2.2.2. Guide Line for Supply Chain Design

2.2.2.1. *Forces Driving Change in Supply Chain Infrastructure*

Supply chain evolution is currently being fueled by a number of factors. While some of these promote operational certainty, others increase efficiency. On the plus side, improvements in information technology continue to drive down the price of gathering, storing, manipulating, and sending data. This lowers the cost of transactions and enables the economical integration of larger amounts of information across all business activities, both intra- and inter-organizationally. Operational uncertainty can be decreased with careful utilization of these integrated data.

On the other side, customers continue to want their suppliers to offer a wider range of products at lower prices and with more flexibility. Product life cycles are getting shorter, and it takes less time for new items to become competitively available. Customers now expect shorter lead times between when an order is placed and when it must be delivered. Because of the shorter lead times, it is almost hard to accurately estimate demand over order lead times for production and distribution planning purposes, which raises operational uncertainty.

The global economy uses a variety of supply chains. Most have certain things in common. For instance, material moves from a raw material state to an end user within each supply chain, and it may even flow backwards due to recycling. An important factor in defining a supply chain is the power dynamics among its participants. For seemingly comparable items, highly distinct supply chain structures may exist, as shown by Fisher (1997). With time, these structures change in response to commercial, technological, and economic influences. Porter (1985) outlines a methodology for assessing a firm's competitive position and explains how competitiveness depends on the power dynamics inside and across supply networks.

Power dynamics in supply networks can shift swiftly and are not always static. For instance, Procter & Gamble and Unilever dominated the American consumer soap supply chain in the middle of the 1980s. Today, huge retailers like Wal-mart have taken over these manufacturers' position as the source of power in the supply chain. As a result, supply chains are dynamic, formed for a specific reason, and have a limited lifespan. Because markets are dynamic and unpredictable, they need to be carefully constructed and run.

2.2.2.2. Five Principles of Supply Chain Management Excellence

The organization of corporate processes, information systems, and decision support guidelines, as well as the style of cooperation between supply chain participants, all have an impact on how well a supply chain performs. There is not much that can be done to repair the "damage" that results if the supply chain is not physically built appropriately. Little competitive advantage can be gained through wider adoption of information systems, decision support tools, or efforts to work with partners if the supply chain infrastructure has long and variable lead times, a poor understanding of customer demand patterns, poor product quality, or uncertain production capacity.

Therefore, a supply chain will only have a competitive edge if it has a number of essential components. We think that the creation of these efficient supply networks needs to be guided by five guiding principles:

- ***Know your customer.*** First and foremost, a supply chain cannot be successfully built without a clear understanding and specification of customer requirements. It is necessary to apply traditional market research methods, build an information architecture to collect client transaction data, store the data, and analyze it in order to get this understanding. These phases are intended to get a clear declaration of what the client needs in terms of what products they want, when they want them by, what services they need, how they want them delivered, etc. The needs of the supply chain will change depending on the client, the product, and the region. The criteria must be well comprehended and used as the cornerstone for building the supply chain.

- ***Construct a lean supply chain organization.*** Build a lean supply chain organization that gets rid of waste, unpredictability, and uncertainty. Lean organization development has been a recent priority for operationally strong companies. As a result, these companies have drastically cut down on setup times, internally shortened lead times, made them predictable and repeatable, decreased work-in-process inventories from months to days of supply, and implemented just-in-time delivery strategies for their most expensive component materials.

  Through these steps, indirect expenses have been significantly lowered, physical space utilization has been improved, and probably most importantly, more cross-trained, empowered, and motivated employees have been produced. For a supply chain to be

effective, all parties must design, coordinate, and carry out their activities so that the chain as a whole possesses the aforementioned characteristics. Even if the supply chain possesses these qualities, fluctuation and uncertainty would reduce its effectiveness and profitability, therefore it might not have a competitive edge.

Lean supply chains must also be built as a system that can adapt rapidly and profitably to changes in demand. Lean thinking must therefore be applied throughout the entire supply chain, not just the operations of a company.

- ***Build tightly coupled information infrastructures.*** A strong information infrastructure, both intra- and inter-organizationally, is a requirement for a supply chain to gain a competitive edge. True B2B collaboration with XML enables supply chain partners to exchange current demand data, inventory status, daily requirements for capacity usage, dynamic marketing plans, modifications to product and process design, and logistical requirements, to name a few. True collaboration calls for more than just data transfer amongst subsequent supply chain participants. True collaboration calls for more than just data transfer amongst subsequent supply chain participants. Instead, it necessitates collaboratively developing production and inventory strategies, as well as consistently executing operational plans with accuracy. Daily capacity utilization must be considered from a systems approach rather than just a local one. Sharing information among partners solely for communication or coordination produces in data, even regarding client desire. There is no genuine collaboration as a result.

- ***Build tightly coupled business processes.*** To support the strategic goals of the supply chain, business procedures that are both intra- and inter-organizational must be defined. These processes, along with the information infrastructure, support the effective movement of materials along the supply chain. While understanding business processes within businesses has received a lot of attention, it is crucial to comprehend what procedures must be developed between organizations in order to utilize and improve the capabilities of the partners. These inter-organizational processes must be designed to take advantage of the increased information availability in driving daily supply chain activities.

- ***Construct Tightly Coupled Decision Support Systems.*** Over the past thirty years, academics and software providers have concentrated on designing and building decision support environments (DSS) for individual firms and supply chains. These environments are based on different models of how supply chains operate. Also, they differ in how they forecast demand, and how they drive production and allocation decisions. Their goal is to generate plans that consider all elements of the supply chain simultaneously. No matter which approach is taken, these systems and the rules embedded within them drive many of the day-to-day supply chain activities. Therefore, they have a substantial impact on the operating behavior, and consequently on the overall performance of the supply chain. How much they enhance this performance depends both on the accuracy of their input data and on the modeling approaches employed. Specifically, these decision support systems need to address uncertainty explicitly.

2.2.3. Supply chain Collaboration for Performance Improvement

SCM has a vast body of literature dating back to the early days of business process evolution because it is utilized by numerous companies all over the world. However, SCC is a very new field of study, and the body of literature is expanding quickly. Academics and practitioners have identified a number of benefits and drawbacks. The benefits and drawbacks of SCC are discussed in this section. Numerous academics have created theoretical and mathematical models to enhance the structure and performance of SCs after discovering the significance of cooperative efforts in SCs.

2.2.3.1. Advantage of collaboration

Cooperation, coordination, collaboration, joint action plans, and partnerships all have similar meanings when used in the context of supply chain management (SCM) (Corsten & Felde 2005; Yu, Yan, & Cheng, 2001). However, CPFR is particularly defined as a web-based initiative (Fliedner, 2003) or internet tool to coordinate the various supply chain activities, such as forecasting, production, and purchasing in SCs to increase the visibility of consumer demand and to minimize any supply-demand discrepancies (Steermann, 2003). According to Caridi, Cigolini, and Marco (2005), CPFR is a process that involves correcting, revising, and proposing prices and quantities in order to come to an agreement on a shared, unique forecast that both buyers and sellers may utilize.

According to VICS (2002), CPFR would aid in cost savings and provide a competitive edge. Numerous case studies that looked at the effects of collaboration have been documented in the literature (see www.ecch.com and ECR, 2002).

The replenishment process is becoming more obvious in SCCs through shared planning and decision-making (Barratt & Oliveira, 2001). For instance, Wal-initiative Mart's to develop profiles on customer purchasing behavior, or "personality traits," has aided in raising demand visibility throughout the value chain (Mclvor et al., 2003). Sport Obermeyer was able to increase forecast accuracy during times of demand uncertainty thanks to information exchange and demand forecasts based on sales data (Fisher 1997).

Many academics and professionals have advised adopting collaborative arrangements to enhance SC performance in recent years. In collaborative supply chains, Ramanathan and Muyldermans (2011) employed structural equation models to pinpoint the driving forces behind soft drink demand. They recommended utilizing those variables for estimating demand. Across order to create knowledge-based systems in supply chains, Cheung, Cheung, and Kwok (2012) gathered actionable quantitative data from a variety of upstream and downstream partners. To test SC models, they have conducted simulation experiments. In order to increase confidence and commitments in SCCs, Ramanathan and Gunasekaran (2013), Nyaga et al. (2010), and numerous other scholars emphasized the significance of open information exchange, teamwork, and investments in supply chain collaborations.

Utilizing five crucial components—responsiveness, planning, shared objectives, trust, and common forecast—any SC may increase visibility (Barratt & Oliveira 2001). The true value of information sharing across SC partners is found in its effective and efficient utilization (Lee, So, & Tang, 2000; Raghunathan, 2001), which is also aided by the appropriate application of information technology (IT) (Cachon & Fisher, 2000; Sanders & Premus, 2005). It is clear from the examples of Wal-Mart and P&G that the adoption of different IT platforms depends on the size of operations.

2.2.3.2. Barrires of Supply chain Collaboration

Organizational and operational barriers to supply chain collaboration can be generally grouped together. Lack of internal integration (organizational barrier), according to Smaros (2007), would be a major hurdle to manufacturers using demand and forecast information effectively (operational barrier). Collaboration connections can occasionally collapse due to organizational behavioral difficulties. Lack of internal forecasting, distrust, and fear of collusion were cited by Fliedner (2003) as the three key barriers to implementing cooperation. Boddy, Cahill, Charles, Fraser-Kraus, and MacBeth (1998) identified six underlying barriers to partnering: underestimating the scale of change, failing to consider the long term, misdefining cost and benefit, placing too much emphasis on relationships, conflicts over priorities, and turbulence surrounding partnering.

In the literature, the use of technology and the extent of information flow in SCs has been addressed from both the advantage and the disadvantage perspectives (Cadilhon & Fearne, 2005; Sanders & Premus 2005; Smaros, 2007). There are times when even a rudimentary degree of information exchange might be advantageous to enterprises. For instance, the German-owned Metro Cash & Carry Vietnam is a business-to-business supplier of groceries that has effectively collaborated while maintaining an unassuming level of simplicity. Without any sophisticated IT, the firm communicates with SC partners using phone calls and fax machines (Cadilhon & Fearne, 2005). The Metro Cash & Carry case makes clear that supply chain collaborations will soon have unfettered access to all relevant data for planning and forecasting. But it's possible that technology won't prevent successful collaboration (Cadilhon & Fearne, 2005; Smaros, 2007). This technological argument completely contradicts the fundamental idea of collaborating planning forcasting and replenisment, a web-based effort to coordinate the many supply chain partners' actions (Fliedner, 2003). Although the use of technology is not generally argued as a necessary condition for collaboration, information sharing and the role of IT were widely accepted as significant phenomena in supply chain collaboration (Sanders & Premus 2005). This is primarily because the technology used in collaborating planning forcasting and replenisment varies greatly across different collaborating planning forcasting and replenisment cases (Danese, 2007).

Additionally, choosing the right technology for a collaboration becomes challenging because of the broader range of tools and technologies that are now readily available. Caridi et al. (2005) presented a novel "learning model" to combine intelligent agents to collaborating planning forcasting and replenisment to assess supply chain performance in various collaborative situations in order to address this problem. By implementing a supplier training program (Smith, 2006) and

looking for possibilities to broaden the scope, barriers to collaborating might be eliminated (Boddy et al., 1998). Numerous SC models have been developed thanks to the ongoing efforts of academics and practitioners to improve supply chain collaboration.

2.2.3.3. Supply Chain Collaboration Models

Generally speaking, the degree of complexity is important for the construction of models at different SCC levels. SCC needs a unique combination of responsibilities and resources as a result of the growth in SC dependencies (Simatupang & Sridharan, 2004). For instance, the CPFR business model (Ireland & Crum, 2005) is built on the experiences of practitioners and the tactics of their company growth process. Even while the CPFR model's fundamental structure has been widely recognized by practitioners, it is also widely acknowledged that various value additions to the current model, depending on the sector adopting CPFR, would make supply chain collaborations sensitive to market changes (Chung & Leung 2005; Smith 2006).

Theoretical model created by Corsten and Felde (2005) relates to the influence of reliance, supplier collaboration, and trust on innovation, purchasing cost reduction, and financial success (Humphreys, Shiu, & Chan, 2001). They proved that supplier cooperation and trust had a favorable effect on the innovation and success of supplu chains. Numerous conceptual frameworks have been developed to explain the organizational and functional components of SCC in literature, as opposed to simulation or mathematical models, which primarily concentrate on performance evaluation. Table 1 provides examples of SC models that were proposed in the literature following the creation of the CPFR framework (mid-1990s).

In two separate setups—one with centralized information and the other with decentralized information—Aviv (2001) studied the effects of collaboration. Based on the uncertainty measure, he came to the conclusion that diverse forecasting skills may enhance the advantages of collaborative forecasting; in other words, the effectiveness of the collaboration has a significant impact on predicting accuracy. A model was created by Lee et al. (2000) to demonstrate the usefulness of demand information sharing, particularly when requests are highly connected across time. Ragunathan (2001) offered a counterargument that, in the event of non-stationary demand, investing in inter-organizational information systems for information exchange is preferable to effective use of internal information that is already available for forecasting.

There aren't many research in the literature on supply chain collaborations simulation-based performance analysis. In three separate scenarios—manufacturer-dominated supply networks,

supplier-dominated supply chains, and balanced decision-making—Kim and Oh (2005) utilized the system dynamics model to analyze the performance of collaborative supply chains. The authors concluded that cooperation along a balanced supply chain will result in significant gains. A system dynamics model was developed by Angerhofer and Angelides (2006) to assess the effectiveness of supply chain management. On SCs, the effects of six components were studied in order to gauge performance: stakeholders, topology, degrees of cooperation, enabling technology, business strategy, and procedures.

In 2007, Chang, Fu, Lee, Lin, and Hsueh proposed the enhanced CPFR (A-CPFR) concept as an enhancement to the current CPFR model with access to market data via application service provider. The forecast's accuracy was evaluated by the authors using a simulation model.

Ramanathan (2012a) has employed the AHP model to compare the success of two businesses based on their usage of SC data. The author came to the conclusion that businesses that regularly communicate information among SCs can profit from continual planning and forecasting development.

2.2.3.4. Performance measurement of Supply Chain Collaboration

Performance measurement models and decision-making frameworks are the two basic areas under which models in SC cooperation are categorized. Some models (Angerhofer & Angelides, 2006; Forslund & Jonsson, 2007; Kim & Oh, 2005) are merely conceptual, while others are supported by mathematical or empirical data (Chen & Paulraj, 2004; Simatupang & Sridharan, 2004). In terms of how they work with regard to cause and effect, these two types of models are often connected to one another. For instance, performance assessment will influence decision-making, and decisions will influence future performance improvement. In order to increase the efficiency of the supply chain and to establish conditions that encourage collaboration, assessing the performance of the SC network is mostly done to pinpoint issues.

A thorough study on how to quantify SC network performance based on cost and service level was undertaken by several researchers (Lee & Padmanabhan, 1997). But in SCCs, communication technologies like data use and information exchange are crucial to the effectiveness of collaboration (Danese, 2007). As a result, monitoring appropriate use of technology and information is becoming increasingly crucial in SCCs.

Some scholars created theoretical frameworks for employing balanced score cards with numerous performance viewpoint metrics to assess performance (Chen & Paulraj, 2004). But only a small number of academics started benchmarking SCs (Simatupang & Sridharan, 2004; Ramanathan, Gunasekaran, & Subramanian, 2011). Evidence from the literature demonstrates that cost, quality, and responsiveness are important factors to consider when assessing supply chain performance. Forecast accuracy is utilized as a sign of effective information usage in SCCs in recent literature (Ramanathan & Muyldermans, 2010). As a result of the lack of information interchange, upstream SC members' demand forecasts would be more unpredictable (Yu et al., 2001), which is a glaring sign that there is a problem with the SC. In an effort to comprehend the challenges and possibilities related to supply chain management, Chen and Paulraj (2004) attempted to develop a conceptual framework.

The procedure of performance measurement is growing more difficult since SCCs have several aspects. The firms can identify the areas that need to be changed before implementation by determining if the environment is favorable for SCC. Aviv (2001) and Smaros' results partially addressed this (2007). According to Aviv (2001), items with short lead times can achieve higher prediction accuracy than those with extensive lead times (Smaros, 2007). Through multiple case studies spanning SC networks, including those of manufacturers, consumers, and suppliers, Danese (2007) found that there are several levels of collaboration in SCs, and that the advantages associated with each level will vary.

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The majority of the research mentioned above have supported the importance of supply chain partners and their contribution to SC performance and profitability. There is, however, no specific study that goes into great depth on how investments, partner counts, or length affect collaborative

partnerships. In this study, they combine all three of these components in SC cooperation to close this gap.

Usha (2013) proposes in his study that the degree of collaboration will depend on factors namely the investment on collaborative technology and partnerships, the number of collaborating partners, and the duration of collaboration in order to find an environment that is favorable for SCC. Usha's study is based on the literature and actual practices in SCs. In the parts that follow, he makes an attempt to create a performance model for SCC using the well-known simulation approach.

Table 2.1. some exisiting models in Supply chain collaborations. Adapted from Usha Ramanathan (2013).

Some existing models in SCC.

Author	Type of model	Key concept
Simulation models		
Cheung et al. (2012)	Knowledge-based model	The model helps to formulate long-term successful SC partnerships
Chan and Zhang (2011)	Collaborative transportation management	The model helps to identify the potential benefits of collaboration in transportation
Chang et al. (2007)	Verification of forecast accuracy	(Augmented CPFR), with application of service provider, will have access to market information and hence can improve forecast accuracy and achieve considerable reduction of inventory
Angerhofer and Angelides (2006)	Performance measurement	The model helps to identify the areas need improvement by measuring the performance of the supply chain
Kim and Oh (2005)	Performance measurement	The model tests impact of different decision making process in collaborative supply chain performance
Fu and Piplani (2004)	Evaluation of supply-side collaboration	Supply-side collaboration can improve the distributor's performance
Optimisation and mathematical models		
Sinha, Aditya, Tiwari, and achd Chan (2011)	Optimisation model	The model helps to improve the performance of petroleum supply chain
Aviv (2001)	Mathematical model for forecasting	Products with shorter lead time have more benefit from supply chain collaboration
Aviv (2007)	Mathematical model for forecasting	Dominance or power of partnership, agility of the supply chain and internal service rate affect the benefits of collaborative forecasting
Aviv (2002)	Mathematical model for joint forecasting and replenishment	Auto-regressive demand process can decrease the demand uncertainty in VMI and CFAR (Collaborative Forecasting and Replenishment) programmes
Chen and Chen (2005)	Mathematical model for joint replenishment	Developed four decision making models to determine optimal inventory replenishment and production policies in a supply chain considering three-level inventory system in a two echelon supply chain; Model also included major and minor set-up cost for manufacturers, and major transportation and minor processing cost for the retailer
Raghunathan (2001), Lee et al. (2000)	Mathematical model	Inventory reduction and cost reduction can be achieved with efficient use of information sharing (Lee et al., 2000) and there is no need to invest in inter-organizational systems for information sharing if order history is available (Raghunathan, 2001)
Mishra and Shah (2009)	Structural equation model	New product development will benefit from collaborative effort of supplier and customer, and cross functional involvement
Nyaga et al. (2010)	Structural equation model	Impact of collaborative efforts in overall satisfaction
Ramanathan and Muyldermans (2010, 2011)	Structural equation model	Impact of demand information in collaborative forecasting
Ramanathan and Gunasekaran (2013)	Structural equation model	Impact of SC collaboration in success of long term partnership
Ramanathan (2012a)	AHP model	Role of SC information in company's decision making
Other models		
Shafiei, Sundaram, and Piramuthu (2012)	Multi-enterprise collaborative decision support system	The model helps decision makers to explore various options of solutions under what-if scenarios.
Singh and Power (2009)	Structural Equation Model	Firm performance will increase if both supplier and customer are involved in collaborative relationship
Kwon, Im, and Lee (2007)	Multi-agent model	The model helps to provide flexible solutions to address SC uncertainties
Caridi et al. (2005)	Multi-agent model	Mutli-agent system can be used to automate and optimise supply chain collaboration
Chung and Leung (2005)	An improvement to CPFR model	Inclusion of 'Engineering change management' increases the responsiveness to market changes
Simatupang and Sridharan (2004)	Collaborative performance system	Collaborative enablers are directly linked with collaborative performance metrics. Four types of collaboration identified: efficient, underrating, prospective and synergistic
Stank et al. (2001)	Logistical service performance model	Collaboration with external supply chain partners along with internal support will improve logistical services
McCarthy and Golicic (2002)	Collaborative forecasting model	Increased revenues and earnings are possible with SCCs.
Lambert and Pohlen (2001)	Conceptual model	Developed a framework with following seven steps: supply chain mapping, identifying value addition process, identifying the effect of relationship on profitability, realign supply chain processes accordingly, measure individual performance, compare value with supply chain objectives, replicate steps at each link in the supply chain

2.3. EMPIRICAL REVIEWS

Contemporary literature highlighted the importance of collaboration across a plethora of studies and indicated that collaborative relationships with network partners results in several advantages. Studies indicate that supplier collaboration reduces procurement hazards and helps the firm achieve competitive position by ensuring reduced transaction cost (Handfield and Bechtel, 2002; Sheu et al., 2006). Evidences show that collaborative relationships helps firms manage risk by sharing (Kogut, 1988) and also provides access to complementary resources (Park et al., 2004); thereby enhancing profitability and performance through the development of competitive advantage over time (Mentzer et al., 2000).

The studies done by Yaxing Yuan, Nguyen Viet, Behzad Behdani (2019) on "The impact of information sharing on the performance of horizontal logistics collaboration: A simulation study in an agri-food supply chain" Dutch horticultural supply chain to study the factors that influence the horizontal collaboration among multiple growers. The simulation model is developed and the potential influencing factors the performance of HLC are studied. The results show that higher information sharing frequency can improve the performance by reducing the travel distance and improving service level and truck utilization. Moreover, the comparison of the performance with and without collaboration show that the growers with higher order frequency would potentially benefit more from an HLC.

The other study conducted by Togar M. Simatupang and Ramaswami Sridharan (2008) on "Design for supply chain collaboration" in the research the finding was that Dell has successfully collaborated with its parts and technology suppliers to directly fulfil their end customer demands. Data were collected from secondary sources that provide information about supply chain collaboration at Dell. Observing the Dell hope page (dell.com) and crosschecking the consistency of secondary sources were used to verify the data about the Dell's operations (Dell and Fredman, 1999; Magretta, 1998; Ng et al., 2003). The study prove that supply chain collaboration has been known as a vehicle to facilitate the chain members to improve individual and collective performance. In the paper, design for collaboration has been proposed as a process of creating and developing the architecture of collaboration which is composed of five key elements, namely a CPS, information sharing, decision synchronization, incentive alignment, and innovative supply chain processes.

Dell has developed supply chain collaboration to support its direct selling and build-to-order. Supply chain collaboration enables Dell to coordinate product, finance, and material flows across company boundaries to achieve new levels of inventory velocity and technology (Magretta, 1998). Dell collaborates with different suppliers and logistics service providers to create just-in-time deliveries and adaptive manufacturing facility. Close collaboration with its suppliers, for instance, enables Dell's manufacturing facility to make possible a hundred varieties of different computer combinations to satisfy the customized orders of its customers at costs that are the lowest among its major competitors. Effective collaboration between Dell and its suppliers can be explained using the five elements of the architecture of supply chain collaboration that include CPS, decision synchronization, information sharing, incentive alignment, and innovative supply chain processes.

Another study was mad by Muhammad et. al. (2018) on "The impact of supply chain collaboration on operational performance: Empirical evidence from manufacturing of Malaysia". This study was conducted to understand how supply chain management approaches contribute to operational performance. The study find out the approaches to enhances the operational performance literature through the information sharing, joint decision making and EDI. This study has empirically proved that information sharing, joint decision making and Electronic Data Interchange have key role toward performance of supply chain members of Malaysian manufacturing. This study shows the impact of three supply chain management approaches, information sharing, joint decision making and EDI with operational performance is positive and significant except EDI. In doing so it introduces a theoretical perspective of potential deployment of supply chain management as a means to achieve operational performance. Overall, this study provides further awareness into the developing field of the relationships among supply chain management and performance measures.

2.4. CONCEPTUAL FRAMEWORK FOR THE STUDY

Conceptual frameworks can function as maps that make empirical research coherent. A conceptual framework is "a form of intermediary theory that attempts to relate to all parts of inquiry (e.g., problem definition, purpose, literature review, methodology, data collection and analysis)," according to Botha (1999). In order to help with the creation of the survey instruments mentioned, a conceptual framework was created.

The relationship between the variables proposed in this study is indicated by the conceptual framework below, which states that supply chain collaboration practices in the Heineken brewery have an impact on the performance of the company.

2.4.1. Operational Performance

"A set of measures used to quantify the effectiveness and efficiency of supply chain interactions and processes, spanning different organizational functions and numerous enterprises and enabling supply chain orchestration," the performance's description reads (Maestrini, Luzzini, Maccarrone & Caniato, 2017). Every business wants to increase performance, but in order to do so, they first need to accurately assess it (Gunasekaran & Kobu, 2007). Previously, cost was used to gauge performance; but, as time went on, additional financial indicators like return on asset, return on investment, sale, and others were added (Anand & Grover, 2015).

Since only financial indicators can be used to gauge overall performance accurately, several operational indicators were introduced with the balance scorecard approach in mind (Attia, 2015; Gunasekaran, Patel & McGaughey, 2004; Shahbaz, Rasi, Zulfakar, Bin & Asad, 2018). Other methodologies, such as quantitative or qualitative metrics, strategic, tactical, and operational measures, and others, also contributed value to supply chain measurement (Arzu-Akyuz & Erman-Erkan, 2010). A thorough investigation revealed that for a good performance measure, all members must be taken into account, as well as both financial and non-financial items, all supply chain levels, as well as all supply chain processes, so that operational performance should be used to gauge performance (Shahbaz, Rasi, Zulfakar, Bin, Abbas & Mubarak, 2018).

While this was going on, researchers had employed a variety of methods to assess the effects of risk sources and supply chain practices using various metrics, including firm or organizational performance (Cook, Heiser & Sengupta, 2011; Shukla, Garg & Agarwal, 2013), product performance, operational performance (Kauppi, Longoni, Caniato & Kuula, 2016; Sukati, Hamid & Baharun, 2013), logistic performance (Effendi, 2015), (Ahmad & Saifudin, 2014; Chen, 2012; Sukati, Hamid, Baharun & Yusoff, 2012; Sundram, Chandran & Bhatti, 2016). However, the metrics used to gauge the performance mentioned above are similar. Operational performance was used to gauge SCM, and its indications included quality, flexibility, customer service, delivery, and cost performance (Kauppi et al., 2016).

The logistic effect for supply chain management was used by Effendi (2015), and its metrics included the order fill rate, lead time for order fulfilment, operational flexibility, inventory turnover, and total logistics cost. Organizational performance has been used to measure SCM, and its dimensions included profit, cost, return on investment, and sales (Florian & Constangioara, 2014). Conclusion: SCM performance had been assessed using a variety of operational, organizational, firm, and financial metrics. A model for assessing performance has been created, and it has shown that these factors should be taken into account when measuring overall performance: cost, quality, flexibility, customer satisfaction, capacity, time, and consistency (Shahbaz, Rasi, Zulfakar, Bin, Abbas & Mubarak, 2018). Therefore, every necessity for enhanced operational performance will be taken into account in this study.

2.4.2. Supply Chain Management Approaches

Supply chain Management approaches have been defined in various ways like according to (Basu et al., 2017) "Supply chain management approaches are used to achieve organizations short term and long term goals such as to enhance productivity, control inventory, reduce waste, increase market share and sustain growth". After measuring the performance now there is a question; how to improve it? Many methodologies and strategies, including just-in-time, lean/agile/hybrid, integration, flexibility, and supply chain collaboration, have been presented and verified in the literature on supply chain management to improve performance. However, as a result of globalization, it is difficult for a firm to survive on its own, and supply chain collaboration has thus become a crucial aspect of modern business processes (Chopra & Sodhi, 2004; Shahbaz, Rasi, Bin & Sohu, 2018). An organization must concentrate on both internal and external factors if it wants to compete (Basu et al., 2017).

In the literature, a number of dimensions for SCM techniques had been suggested. (Sezen, 2008) investigated SC integration, SC design, and IS and found that only SC design had an impact on resource and output performance and that none of the other approaches had any effect on flexibility performance. Long-distance relationships, information sharing, leveraging the internet, advanced planning techniques, and supply and distribution network structures are the five dimensions that (Cook et al., 2011) developed and verified, and they discovered a positive relationship with organizational performance.

Additionally, supply chain management approaches by customer and supplier relationships, delay, shared goals and a vision, level and quality of IS, and reward/risk sharing have all been studied (Sundram, Ibrahim, and Govindaraju, 2011). According to this survey, all relationships are favorable, with the exception of those with customers. Customer integration did not significantly improve performance, according to a different study that looked into internal integration, customer integration, and supplier integration. As a result, numerous studies on supply chain management strategies have been carried out and have shown that they have a favourable impact on performance.

Interconnectedness among stakeholders is necessary given the global supply chain's explosive growth. As a result, the supply chain becomes highly interdependent and complex (Christopher et al., 2011; Elkins et al., 2005; Kamalahmadi & Parast, 2016). Supply chain collaboration has been shown to boost performance in empirical investigations (Marn-Garca, Alfalla-Luque, & Machuca, 2018; Sheu et al., 2006). A further illustration of the value of cooperation comes from Dow Chemical Company (2011), which is proposing a plane with partners under its policy of dove chemical company. In the same way that Dow has developed a highway security network with their North American logistics partners, who handle 90% of Dow's shipments, sharing intelligence information, discussing best practices, and creating a shared security plane for safe shipment.
The three main components of SCM techniques, according to Ataseven and Nair (2017), are information sharing, joint decision making (JDM), and cooperation. By reviewing the research, it can be determined that incentive alignment, information sharing, and cooperative decision-making are the most crucial ways. These approaches have also been empirically proven in numerous nations and businesses.

2.4.3. Information Sharing

Information sharing, according to Cao & Zhang (2013), is defined as “the willingness to make strategic and tactical data such as inventory levels, forecasts, sales promotion, strategies, and marketing strategies available to firms forming supply chain nodes”. Many studies, (Christopher, 2011; Shahbaz, Kazi, Othman, Javaid, Hussain & Rasi, 2019), agreed on that the ability to see from one side of the channel to last is crucial, information is assumed as blood for supply chain collaboration. In the work of Qrunfleh (2010), the aim of information sharing is to improve the efficiency and effectiveness in the whole network of organizations and finally enhance not only the firm performance but also the operational performance. Singh (2013), also mention in his work

that Information sharing may also include logistic, customer, quality, time, market changes, design or uncertainty. Information sharing has been investigating in multiple industries and regions and revealed that it has a major contribution to enhancing operational performance (Abdallah, Obeidat & Aqqad, 2014; Effendi, 2015). In addition, Flynn, Huo & Zhao (2010), in their work mentioned that information sharing has positively affects performance in many ways like enhanced service levels, customer responsiveness, decreased costs, and reduced levels of complexity

Huo, Zhao and Zhou, (2014) has studies information sharing with suppliers, customers and internal in Chines manufacturing and revealed that all have a positive effect on operational performance and internal information sharing also has a positive relationship with external information sharing. Information sharing has a positive effect on operational performance but not significantly in the manufacturing sector of Turkey (Sezen, 2008; Shahbaz, Chandio, Oad, Ahmed, & Ullah, 2018). The today supply chain has become more fragile and risks have become a serious concern.) did a comprehensive literature review was conducted by Cao, Vonderembse, Zhang & Ragu-Nathan (2010) and found that information sharing has not only a positive effect on performance but also a good tool for reducing uncertainty. Based on the literature review below hypothesis has been developed.

2.4.4. Decision Synchronization

According to Cao & Zhang (2013), Decision synchronization or Joint Decision Making is defined as the "process by which supply chain partners coordinate activities in supply chain planning and operations for optimizing the supply chain benefits it includes plans, combines information, resolves problems and develops rules and regulation and procedures. An effective strategic coalition and worthy relationship with customers and suppliers are required and it should consist of trust, loyalty and positive relationship (Basu et al., 2017). The aim of joint decision making is to align partners and to synchronize decisions on order placement, inventory replenishment and order delivery (Cao et al., 2010). Meanwhile, every partner has its own objectives and goals, so it is sometimes very hard to come on mutual points that may cause uncertainty (Kauppi et al., 2016), to reduce this uncertainty joint decision making has become an important strategy for today business.

Additionally, shared decision-making has a good impact on operational performance, which has been empirically supported (Effendi, 2015; Ha, Park & Cho, 2011; Shukla et al., 2013). When the

quality of the information is high, shared decision-making has a favourable association with operational success, according to Wiengarten, Humphreys, Cao, Fynes, and McKittrick (2010). Joint decision-making with suppliers and customers enhances logistical efficiency, according to (Effendi, 2015). Joint decision-making at the strategic, tactical, and operational levels increases the depth, strength, and intimacy of relationships, which in turn promotes operational performance (Jüttner & Maklan, 2011).

2.4.5. Incentive Alignment

Incentive Alignment refers to the process of sharing costs, risks, and benefits among supply chain partners (Simatupang and Sridharan, 2005). According to Togar et. al., (2008) the contribution of incentive alignment can be judged based on compensation fairness and self-enforcement. Compensation fairness ensures that aligned incentives motivate the chain members to share equitably the loads and benefits that result from collaborative efforts. An effective incentive scheme means that the chain members are self-enforcing for aligning their individual decisions with the mutual objective of improving total profits.

Incentive alignment according to Manthou et al., (2004) it includes determining costs, risks, and benefits as well as formulating incentive schemes. Successful supply chain partnerships require that each participant share gains and losses equitably and the outcomes of the collaboration are quantifiably beneficial to all. Lee and Whang (2001) was underlining that incentive alignment requires a careful definition of mechanisms that share gains equitably, which means gains are commensurate with investment and risk.

Expertise agreed on that in an attempt to create an effective incentive alignment, the chain members should answer three basic questions: what level of incentive is to be paid, how the incentive is to be linked to overall performance, and how the incentive is to be paid (i.e. its composition).

2.4.6. Electronic Data Interchange

In the work of Christopher, (2011) Electronic Data Interchange (EDI) and now the Internet have enabled partners in the supply chain to act upon the same data, at the same time with minimum resources. It is well-defined as a set of specifications for exchanging standard business documents such as purchase orders, invoices, and bills of lading over computer networks. In their seminal

work, Arshinder, Kanda & Deshmukh, (2006) Electronic data interchange is defined as the direct computer-to-computer transfer of information (possibly through a third party) between independent organizations. Electronic data interchange provides visibility to data across supply networks, finally, process management applications, and server-to-server links that enable true and real-time channel information and transaction harmonization. From this level, the degree of collaboration strengthens with increasing communication to facilitate joint operations and coordination, where companies in the supply chain use the competencies of network partners, to cooperation where channel partners (Ross, 2011). Electronic data interchange has numerous advantages like faster information flow, quick payments, receive standardized data, easy tracking of orders, and visibility of information to all members and easy updating of received data (Arshinder et al., 2006). In several studies, (Cook et al., 2011; Shukla, 2016; Shukla et al., 2013). Electronic data interchange has been revealed that it has positive and significant effects on performance.

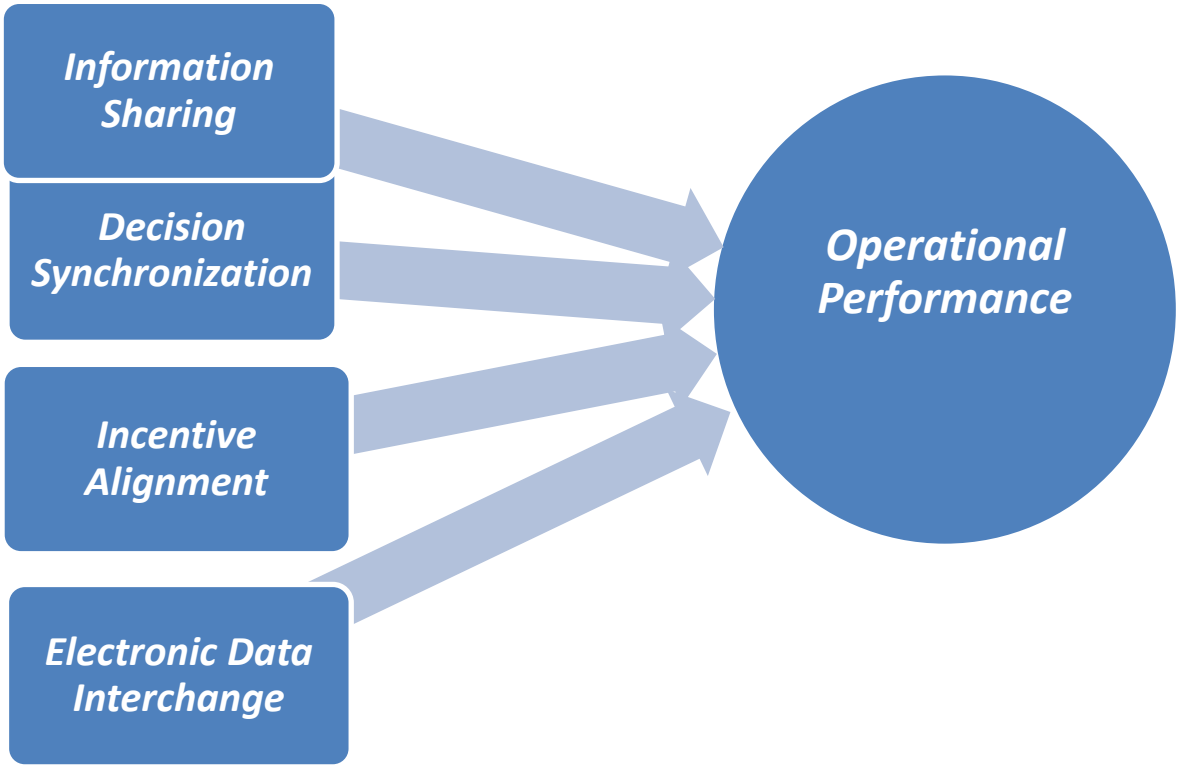

Figure 2.2. Research Framework

Source: Adapted from Muhammed et.al., (2018)

2.5. GAP

Despite all the advantages of Supply chain collaboration to the firms, there have been few studies and research on this subject particularly in brewery industry. Few studies that exist did not show the connection between the supply chain collaboration and an organization's performance using information sharing, decision synchronization, incentive alignment, and electronic data interchange as a variable. Thus, the study sought to assess the effect of supply chain collaboration practice on organizational operational performance of Heineken beer Share Company.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1.Introduction

The aim of this study was to find how much supply chain collaboration approaches have effects on operational performance. To this end this chapter discusses the approaches and design of the research, population and sampling design used, methods of data collection and data analysis technique.

3.2.Research Approach

In this study both quantitative and qualitative approaches were employed. The quantitative approach was used to capture the responses of the sample respondents through questionnaire, while qualitative approach was employed to use detail views and opinion of some selected respondents with the use of open ended questions.

3.3. Research Design

The method chosen for this study was research by case study. In particular, the case study method used was the "single-case design" as called by Yin (1994), with single unit of analysis and single number of cases. Research by case study was preferred, since it enables a more descriptive and exploratory approach allowing for more rich insights into the research object (Yin, 1994; Miles and Huberman, 1994). The case study presented in this research is about Heineken brewery Ethiopia, one of the biggest brewery in Ethiopia, and the collaboration with its supply chain partners.

3.4.Target Population

In research, population refers to identifiable pool of cases that the researcher wants to study (Neuman, 1997). It therefore, identifies a set of interest to the researcher, and is pertinent to the information problem (Hair et al., 2008). Moreover, it entails the specification of the survey group which will be studied. In the present study, the total target population for this study was constitute (N= 168) Managerial employees (ranked as MT, MT-1, MT-2, it is to mean senior management, middle level management and lower level management respectively) of different departments at the head office and branch offices of Heineken brewery. The departments that were included are: supply and logistic department, Finance department, communications and marketing department,

Information technology department, procurement and facilities department, and Institutional support department.

Mugenda and Mugenda, (2003) defines the target population as the population the researcher studies, and whose findings are used to generalize the entire population. As the study focused on the practices of supply chain collaboration of the Heineken brewery and the contribution of this collaboration to the company's performance, the emphasis was on the area of information available to the mentioned variable under the research designed section. Thus, the total number of targeted population comprises of 168 which is available throughout the company's branch, of which 60% (108) was considered as the sample which found in Addis Ababa in this study with the belief that it would properly represent the total population because of the homogeneity.

3.5. Sample and sampling technique

Sampling procedure refers to the strategy which was employed to draw the sample as well as the way in which the sampling units were selected. The present study used random sampling technique accompanied with simple random sampling technique (lottery) method to select 108 respondents from the total of 168 which was segregated to three strata. Hence the sample constituted in this study is as follows.

Table 3.1. Population and Sample Size

Respondents	***Population***	***Sample Size***
MT (Senior management)	7	4
MT -1 (Middle level Managers)	50	30
MT-2 (Lower level Mangers)	111	67
Total	168	101

Source: Company's HRM Department Information, 2022

3.6. Data Collection Instruments

The data collection instruments used was questionnaire which was designed using the variables identified as important for meeting the study objectives. According to McNabb (2008), questionnaires are the most popular way of gathering primary data, particularly when the research problem calls for quantitative analysis. Secondary data was used to collect data from existing sources in the organization.

3.7. Data collection procedure

The questionnaire was administered using a drop and pick later method. The primary source of data collection method used in the study was questionnaire. After a comprehensive literature review, this study adapts questionnaire from different previous studies according to best match with industry. Questionnaire with the Likert scale of five (5) Points were distributed to respondents. The questionnaire was developed in the way to collect data for five components of supply chain collaboration such as information sharing, joint decision making, electronic data interchange, and for dependent variable "operational performance".

3.8. Reliability and Validity of the Study

Establishing the validity of the scores in a survey helps researchers to identify whether an instrument might be a good one to use in survey research (Creswell and Creswell, 2018). In more recent studies, construct validity has become the overriding objective in validity, and it has focused on whether the scores serve a useful purpose and have positive consequences when they are used in practice (Humbley & Zumbo, 1996). Validity can be achieved by having objective questions included in the questionnaire. This has been confirmed by pre-testing the instrument that has been used to identify and change any ambiguous, offensive questions and technique. Reliability, on the other hand, refers to a measure of the degree to which research instruments yield consistent results (Mugenda and Mugenda, 2003). In this study, reliability analysis using Cronbach Alpha to show how the variables are best suited for the questionnaire was done and presented in the analysis section.

3.9. Data presentations and analysis

The data collected through questionnaire were analysed in line with the basic research questions. The data that were obtained through open-ended part of the questionnaires were analysed qualitatively using narrative statements and explanations. These qualitative data were used to elaborate the ideas and also to show similarities and differences among the responses as a means of triangulation. Following data collection, but prior to data entry, all data were carefully screened for accuracy. After the data have been screened for completeness and accuracy, data entry reasonably straightforward. The study thus generated the descriptive statistics results such as frequency, mean and percentage with the help of SPSS version 21. The results of descriptive statistics were presented with the use tables. For descriptive univariate analysis using mean values computed from the 5-likert scale, the study followed the decision rule recommended by (Andrew,

2017). To this end, the study used the following ranges of mean values and percentage for the interpretation and discussions to the results of analysis.

Table 3.2: Decision rule for univariate analysis

Low level	Moderate level	High level
$1 \leq Xi \leq 2.5$	$2.5 < Xi \leq 3.5$	$3.5 < Xi \leq 5.0$
$20\% \leq Xi \leq 50\%$	$50\% < Xi \leq 70\%$	$70\% < Xi \leq 100\%$

Source: Andrew (2017)

In addition, correlation and multiple regression analysis from inferential statistics were executed to examine the effects of components of supply chain collaboration on the operational performance of the business firm.

3.10. Ethical consideration

Ethical consideration is about keeping the rights of respondent's ethical beliefs. The researcher has informed respondents for what purpose their response will be used and that their response is confidential and would only be used for academic purposes. This has made respondents confident and free when responding to questionnaire. By saying this, the researcher had explained these to respondents of Heineken employees and had used their responses only for academic purposes.

CHAPTER FOUR

DATA ANALYSIS, FINDINGS, AND DISCUSSION

4.1. Introduction

The chapter presented the results and discussions on the basis of data collected from the selected respondents in line to the stated objectives. To this end, the chapter covers the background characteristics of the respondents, the components of supply chain collaboration such as information sharing, decision synchronization, incentive alignment, electronic data interchange and the operational performance of the business organization. In addition, the effects of each of the components of supply chain on operational performance of the business were discussed in this chapter.

4.2. Response rate

Questioners were distributed for a total sample of 101 managerial respondents who are working in the head office and branch office of Heineken brewery. From the total questionnaire distributed, 91 questionnaire were returned successfully. Thus, data were analyzed from the total of 91 respondents which makes the response rate of 90.1 percent.

4.3. Background Characteristics of the Respondents

This section deals with the background characteristics of the respondents who participated in the study in terms of sex, age, education and service years in their current organization. In this regard, Table 4.1 summarizes and presents the background characteristics of the respondents.

Table 4.1: The Background Characteristics of the Respondents

Attributes	Category	Frequency	Percentage
Sex	Male	62	68.1
	Female	29	31.9
	Total	91	100
Age	Below 25	-	-
	25-35	42	46.2
	36-45	49	53.8
	Above 45	-	-
	Total	91	100

Educational status	College Diploma	6	6.5
	First Degree	45	49.5
	Master's Degree	40	44.0
	Above Master's Degree	-	-
	Total	91	100
Service Years	1-3 Years	13	14.3
	4-7 Years	58	63.7
	8-10 Years	20	22.0
	Above 10 Years	-	-
	Total	91	100

Source: Field Survey, 2022

Table 4.1 shows the background characteristics of respondents who participated in this study. To this end, the sex, age, educational status and service years of respondents who participated in this study were addressed. Concerning the sex of respondents, majority (68.1%) are male while 31.9% are female participants. This implies that the views reflected in this study has consideration of both sex in the case organization. In regard to age, the participants of the study are in the age range of 25-45 years who are at the maturity stage to well realize the issues in this study in relation with the operation of their organization.

In regard to the educational status, majority of the respondents (93.5%) are first degree and Master's degree holders which assures that data for this study have been collected from respondents who have adequate knowledge to understand the issue under the investigation of this study. Furthermore, majority of the respondents who participated in this study have sufficient experience to realize the actual operational performance and the practices of the supply chain collaboration in their organization which were addressed in this study.

4.4. Reliability and Consistency

Reliability clearly depicts the internal consistency of variables used in the study. To measure the reliability of variables, Cronbach's alpha is adequate measure of consistency and reliability of variables with a scale between zero and one (Monette, Sullivan & Dejong, 2002). Variables with results of 0.70 or greater Cronbach's alpha values have passed the reliability and consistency test. Thus, in this study, the researcher has used Cronbach's alpha coefficient to measure the reliability of each variable as shown in the below table.

Table 4.2: Summary of Reliability Test Results

Items	Number of items	Cronbach alpha
Information sharing	5	0.818
Decision synchronization	4	0.729
Incentive Alignment	5	0.779
Electronic Data Interchange	5	0.897
Operational performance	5	0.834

Source: Field survey, 2022

Table 4.2 shows the reliability of items used in this study. Accordingly, the test result confirms that all items used in this study for each of the variables have Cronbach's alpha coefficient of 70%. This clearly implies that data for the components of supply chain and operational performance of the business firm surveys are collected from all respondents with their consistent views which can be believed to make reliable discussions.

4.5. Information Sharing

Information sharing is among the factors that determine the operational performance of business organizations. In this line, respondents were asked to reflect their views in regard to the experience of the organization in free exchange of information. In this regard, Table 4.3 summarizes and presents the views of the respondents as follows.

Table 4.3: Views of Respondents on the Information Sharing Experience of the Organization

Items	Minimum	Maximum	Mean	Percent
Our firm and supply chain partners exchange relevant information.	4	5	4.31	86.2
Our firm and supply chain partners exchange timely information.	3	5	4.23	84.2
Our firm and supply chain partners exchange accurate information	2	5	3.87	77.4
Our firm and supply chain partners exchange complete information	2	5	3.87	77.4
Our firm and supply chain partners exchange confidential information	1	5	3.18	63.6
Aggregate Mean			3.89	77.8

Source: Field survey, 2022

Table 4.3 shows the views of respondents on each of the variables in regard to the information sharing component of supply chain in the business firm. To this end, the result reveals that the exchange of relevant information with partners and the experience of the firm in timely exchange of information with partners are with the average of 4.31 and 4.23. This implies that the practice of the firm in sharing relevant information and in timely manner is high which need to be strengthened in the future. The lower practice in terms of information exchange was noticed in sharing confidential information. Overall, the aggregate mean for the experience of information exchange in the business firm was found 3.89 (77.8%). This confirms that the experience of the business firm in exchange of information with supply chain partners is at high level which to be strengthened further since proper information exchange will allow the firm to make timely decision that is based on reliable facts.

4.6. Decision Synchronization

Decision synchronization refers to the process by which supply chain partners coordinate activities in supply chain planning and operations for optimizing the supply chain benefits (Cao & Zhang, 2013). In line to this, respondents were asked to express their views in relation to the practice of their organization in decision synchronization. Thus, Table 4.4 presents and summarizes the views of respondents toward the actual practice of their organization in decision synchronization.

Table 4.4: Views of Respondents toward the Actual Practice of Their Organization in Decision Synchronization

Items	Minimum	Maximum	Mean	Percent
Our firm and supply chain partners jointly plan on promotional events	3	5	4.55	91.0
Our firm and supply chain partners jointly develop demand forecasting	2	4	3.10	62.0
Our firm and supply chain partners jointly manage inventory	2	5	3.79	75.8
Our firm and supply chain partners jointly plan on product assortment	2	5	2.91	58.2
Our firm and supply chain partners jointly workout solution	2	5	3.97	79.4
Aggregate Mean			3.67	73.4

Source: Field Survey, 2022

Table 4.4 presents the views of respondents in regard to the decision synchronization practice of the business firm. In line to this, the result shows that the practice of the business firm in jointly planning with partners for the promotional events is 91% which can be considered as high and useful for the firm to convince its customers to towards its product in the market. Besides, the practice of the business firm increase in jointly working out solution is found high (79.4%), followed by jointly managing inventory with supply chain partners with mean value of 75.8%. The remaining components of decision synchronization such as jointly developing demand forecasting, and planning on product assortment jointly with partners are at moderate level with mean values of 3.10 (62%), and 2.91 (58.2%) respectively.

4.7. Incentive Alignment

Incentive alignment is viewed as the process of sharing costs, risks, and benefits among supply chain partners (Simatupang and Sridharan, 2005). To this end, the respondents were asked to share their views in regard to the incentive alignment practice of their current organization. In this regard, the views of respondents were summarized in Table 4.5 below.

Table 4.5: Views of the Respondents toward the Actual Practices of the Organization in Incentive Alignment

Items	Minimum	Maximum	Mean	Percent
Our firm and supply chain partners have co-developed system to evaluate and publicize each other's performance	2	5	3.95	79.0
Our firm and supply chain partners share costs	2	4	2.82	56.4
Our firm and supply chain partners share risk that can occur in the supply chain	2	5	2.82	56.4
The Incentive for our firm commensurate with our investment and risk.	2	4	3.12	62.4
Aggregate Mean			3.18	63.6

Source: Field Survey, 2022

Table 4.5 presents the views of respondents in relation to the incentive alignment practice of the business firm. In this regard, the result assures that the firm has high (79%) experience of developing system to evaluate and publicize the performance in collaboration with the supply chain partners. This would give an opportunity for the firm to build trust with its supply chain partners for future business collaboration. However, the experience of the firm with the remaining items of incentive alignment such as sharing cost, sharing risk and the commensuration of incentives with investment and risk are at moderate level which call for actions to improve in the future. The overall practice of the firm with incentive alignment has been computed on average as 3.13 (63.6%) which could be considered as at moderate level that need to be improved in the future to accelerate the firm's competitive advantage.

4.8. Electronic Data Interchange

Electronic data interchange is viewed as a set of specifications for exchanging standard business documents such as purchase orders, invoices, and bills of lading over computer networks (Arshinder, Kanda & Deshmukh, 2006). In order to assess the practice of electronic data interchange in the case organization, respondents were asked to share their views. In this regard, Table 4.6 summarizes and presents their views as follows.

Table 4.6: Respondents' Views on the Actual Practice of Electronic Data Interchange in the Organization

Items	Minimum	Maximum	Mean	Percent
Our company creating linkage with suppliers through IT	2	5	3.79	75.8
Our company creating linkage with Customers through IT	3	5	4.07	81.4
Our company has implemented application Integration among internal functions	2	5	3.91	78.2
Our company employed integrative inventory Management	2	5	3.99	79.8
Our company has implemented data integration among internal functions	2	5	3.76	75.2
Aggregate Mean			3.9	78.0

Source: Field Survey, 2022

Table 4.6 indicates the actual practice of the business firm in regard to the electronic data interchange. To this end, the result clearly shows that the overall practice of the firm in electronic data interchange is on average 3.9 (78%). This implies that the current practice of the business firm is relatively high which should be nurtured since the electronic data interchange facilitates the delivery of services and one of the area that contributes for competitive advantage of business firms.

4.9. Operational Performance

Operational performance is related with the adoption of strategy to improve customer service delivery, advance service delivery speed, and reduction of operation cost. To address this practice, respondents were asked to reveal their views. In this regard, Table 4.7 summarizes and presents the views of respondents as follows.

Table 4.7: The Views of Respondents towards the Operational Performance of the Organization

Items	Minimum	Maximum	Mean	Percent
Our company SCC strategy ensure high quality	4	5	4.48	89.6
Our company SCC strategy enhance flexibility	3	5	4.43	88.6
Our company SCC strategy improve customer service	4	5	4.52	90.4
Our company SCC strategy advance delivery Speed	4	5	4.58	91.6
Our company SCC strategy decreasing operational cost	4	5	4.48	89.6
Aggregate Mean			4.49	89.8

Source: Field Survey, 2022

Table 4.7 depicts the current status of the firm in its operational business performance. Accordingly, the result reveals that performance of the business firm in terms of ensuring high quality, enhancing flexibility, customer service improvement, service delivery speed and decreasing operational cost are high. Besides, the overall operational performance of the business firm was found 4.49 (89.8%). This implies that the current operational performance status of the business firm is high which should be strengthened in the future to maintain its competitiveness. Furthermore, Table 4.8 presents the summary of the components of the supply chain collaboration and the current operational performance of the business firm.

Table 4.8: Summary of Variables

Variable	Mean	Percentage
Information Sharing	3.89	77.8
Decision Synchronization	3.67	73.4
Incentive Alignment	3.18	63.6
Electronic Data Interchange	3.9	78.0
Operational Performance	4.49	89.8

Source: Field survey, 2022

Table 4.8 presents the summarized values of the supply chain collaboration dimensions and the current operational performance of the business firm. In this regard, the result assures that the current status in the operational performance and three components/dimensions of the current supply chain collaboration such as electronic data interchange, information share, and decision

synchronization are relatively high. However, aligning incentive of the firm with the investment and risks is at moderate level that requires attention for future action since it is very important to align the current profit of the firm with the additional investment for future growth of the firm.

4.10. The Effects of Supply Chain Collaboration Dimensions on Operational Performance

This section discusses the influence of supply chain collaboration dimensions on operational performance of the business firm. The influence supply chain collaboration dimensions on operational performance has been analyzed using the multiple regression analysis.

4.10.1. Assumptions for the Use of Regression Analysis

Before running multiple regression analysis, preconditions need to be fulfilled. To meet this requirement, correlation analysis, Normality Test, ANOVA test and Multicollinearity analysis were performed.

I. Correlation Analysis

Correlation analysis has been executed to check the association of each of independent variables among themselves and also with dependent variable as presented in Table 4.9 below

Table 4.9: Results of Correlation Analysis

Correlations						
		Information Sharing	Decision Synchronization	Incentive Alignment	Electronic Data Interchange	Operational Performance
Information Sharing	Pearson Correlation	1	.312**	-.033	.019	.163
	Sig. (2-tailed)		.003	.759	.856	.123
Decision Synchronization	Pearson Correlation	.312**	1	.618**	.405**	.333**
	Sig. (2-tailed)	.003		.000	.000	.001
Incentive Alignment	Pearson Correlation	-.033	.618**	1	.451**	.287**
	Sig. (2-tailed)	.759	.000		.000	.006
Electronic Data Interchange	Pearson Correlation	.019	.405**	.451**	1	.010
	Sig. (2-tailed)	.856	.000	.000		.927
Operational Performance	Pearson Correlation	.163	.333**	.287**	.010	1
	Sig. (2-tailed)	.123	.001	.006	.927	
**. Correlation is significant at the 0.01 level (2-tailed).						

Source: Field survey, 2022

The results of correlation analysis in the table shows that the response variable (operational performance) is significantly correlated with the Decision Synchronization and Incentive Alignment at 1% significance level. Correlation becomes significant here, since higher value of correlation coefficient represents better prediction of dependent variable with lowest possible errors.

According to Samithambe (2019), high level of multicollinearity (VIF ≥ 5) becomes possible, approximately when Coefficient of Correlation (r) ≥ 0.9 (for positively correlated predictors) or r ≤ -0.9 (for negatively correlated predictors). However, in this study all predictors, to each other, have the coefficient of correlation (r) < 0.9, implies that the correlation does not cause the problem of multicollinearity. Hence, this confirms that interpretation can be possible with the correlation coefficient of the predictors on the outcome variable to examine the effects using the Multiple Regression Model.

II. Normality Test

Prior to run the multiple regression analysis, the normality of dependent variable that determines whether sample data has been drawn from a normally distributed population (within some tolerance) need to be tested. In this regard, the normality curve with use of histogram has been drawn to check normality of the sample data as shown in Figure 4.1 below.

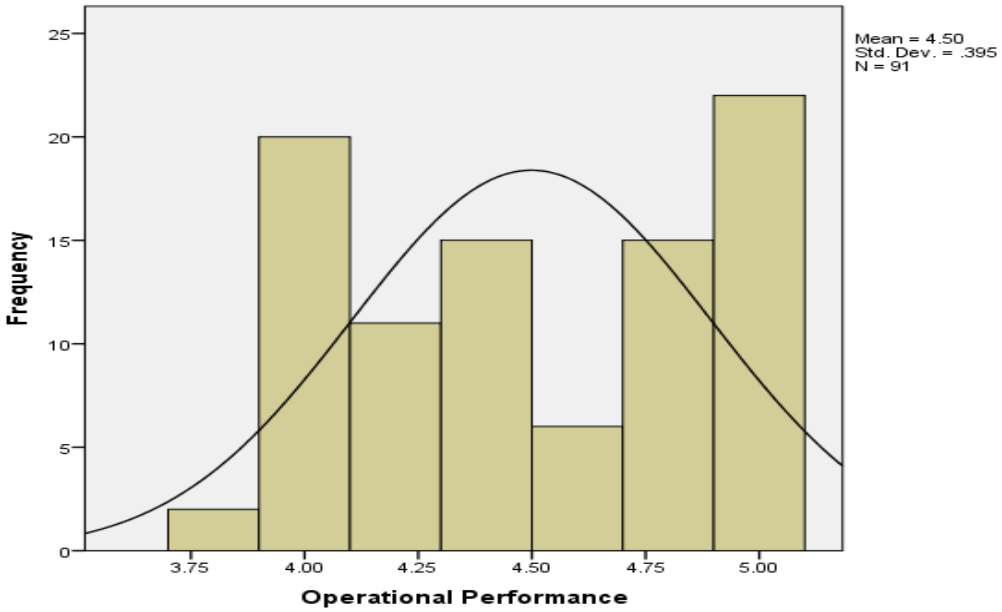

Figure 4.1: Normality Test

The normality curve in Figure 4.1 shows the Mean value of 4.50 and Standard deviation (SD) of 0.395. According to Jeyaseelan (2007), if SD is less than half mean, data are considered normal. Therefore, 0.395 < (0.5*4.50) confirms that the sample data for dependent variable used in the study is normal.

III. Adequacy of the Model

The adequacy of model was tested by employing ANOVA test before using the results for interpretation and found that the (Sig. < 0.05) confirms that the model is adequate by ensuring that the coefficient (B) is non-zero at least for one of the independent variables in the model (Table 4.10). This clearly ensure the adequacy of the model and confirmed that the use of multiple regression model is adequate to predict the effect of predictors on outcome variable as indicated in the Table 4.10 below. The Model summary has been also checked to see what proportion of the changes in outcome variable is explained by the predictors included in the model.

IV. Multicollinearity Diagnosis

The Multicollinearity problem has been also checked by using Variance Inflation Factor (VIF) and found that its value is less than 10 for all independent variables which ensure the absence of any problem in this regard (Table 4.11).

Table 4.10: Model Summary and ANOVA Result (Dependent variable: Operational Performance)

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.400[a]	.560	.521	.370
Predictors: (Constant), Electronic data interchange, Information share, Incentive alignment, Decision Synchronization				

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	2.242	4	.560	4.089	.004[b]
	Residual	11.788	86	.137		
	Total	14.030	90			

a. Dependent Variable: Operational Performance

b. Predictors: (Constant), Electronic data interchange , Information share , Incentive alignment, Decision Synchronization

The model summary table confirms that 56 % of the variations in dependent variable (Operational performance) is explained by the predicators in the model (information share, decision synchronization, incentive alignment and electronic data interchange). In addition, the ANOVA table assures that the regression model is adequate to regress the response variable over the predicators.

Table 4.11: The Results of Multiple Regression Analysis on Effects of Supply Chain Collaboration on Operational Performance of Business Organization

Variables	**Coefficients[a]**						
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
	B	Std. Error	Beta			Tolerance	VIF
(Constant)	3.550	.391		9.077	.000		
Information share	.076	.083	.100	.915	.363	.819	1.221
Decision Synchronization	.182	.108	.238	1.684	.096	.491	2.037
Incentive alignment	.136	.080	.230	1.689	.095	.525	1.905
Electronic data interchange	-.114	.067	-.192	-1.705	.092	.770	1.299
a. Dependent Variable: Operational Performance							

Source: Field survey, 2021

The regression analysis result shows the effects of the dimensions of supply chain collaboration on Operational Performance of the business organization. To this end, the three dimensions of supply chain collaboration such as Decision Synchronization, Incentive Alignment and Electronic Data Interchange have statistically significant effect on Operational Performance of business firm at 10% significance level. This clearly confirms that the three dimensions have high influence on the operational performance of business firms. As it can be seen from the table, a one unit change of

decision synchronization in supply chain collaboration can increase the operational performance level of business firms by 18.2% when other factors remain constant. Again, due to a unit change in current efforts of incentive alignment with the future investment and risk, the operational performance level of business firms will increase by 13.6% while other factors remain constant. Furthermore, a unit change in current efforts of enhancing electronic data interchange would decrease the level of operational performance of business firms by 11.4%, in the constant of all other factors. The decrease of operational performance of business firms could be because of dissemination of secrete business information to competitors in enhancing electronic data interchange.

In general, the test results of the regression analysis confirm that the dimensions of supply chain collaboration significantly influence the operational performance of business organizations. This finding also concurs with the findings of the study by Dell and Fredman (1999); Magretta (1998); Ng et al., (2003) which proved that supply chain collaborations are known as a vehicle to facilitate the chain members to improve individual and collective operational performance.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATION

This chapter is presents the summary of major findings from the analysis section, conclusion drawn and recommendation forwarded for improving the identified gaps.

5.1. Summary of Findings

This section deals with the major findings drawn from the analysis section inline to the objectives of the study. To this end, the following are the summary of major findings.

- The overall experience of information exchange in the business firm was found 3.89 (77.8%) which confirms that the experience of the business firm in exchange of information with supply chain partners is at high level.
- The decision synchronization practice of the business firm has been found on average 3.67 (73.4%) which can be considered as high.
- The overall practice of the firm with incentive alignment has been computed on average as 3.13 (63.6%), which could be considered as at moderate level that need to be improved in the future to expedite the firm's competitive advantage.
- The overall practice of the firm in electronic data interchange has been computed on average 3.9 (78%). This confirms that the current practice of the business firm is relatively high.
- The overall operational performance of the business firm was on average found 4.49 (89.8%). This implies that the current operational performance status of the business firm is at high level.
- The response variable (operational performance) is significantly correlated with the Decision Synchronization and Incentive Alignment at 1% significance level. In addition, the result of regression analysis confirms that the three dimensions of supply chain collaboration such as Decision Synchronization, Incentive Alignment and Electronic Data Interchange have statistically significant effect on Operational Performance of business firm at 10% significance level.

5.2. Conclusion

The main objective of this study was to examine how the dimensions/components of Supply Chain Collaboration determine the Operational Performance, the Case of Heineken Brewery Sc., in Ethiopia. To achieve this objective data have collected from senior management, middle management and lower management with the use of close ended and open ended questions for four dimensions of supply chain collaboration and the operational performance of the business firm or brewery S.C.

The study has found that the overall experience of the business firm in exchange of information with its supply chain partners is at high level that need to be strengthened more for enhancing the competitive advantage in the business environment. In addition, the practice of decision synchronization and electronic data interchange were found high in the business firm that to be more nurtured to ensure its competitiveness. The overall practice of the firm with incentive alignment has been confirmed at moderate level that needs due attention that to be considered for taking necessary measures since the alignment of current benefit with future investment and risks is critical for ensuring the competitiveness of business firms in the competitive market. The study has also found that the overall operational performance of the business firm was found at high level. In general, the study has found that the three dimensions of supply chain collaboration such as Decision Synchronization, Information sharing and Electronic Data Interchange have statistically significant effect on the Operational Performance of business firm.

5.3.Recommendation

This section forwards the suggestions for actions to be taken to mitigate the gaps found in this study in relation to the supply chain collaboration and operational performance of the brewery S.C.

- The share company has to give due attention to improve the benefit alignment with the future investment and risk in order to expedite its competitiveness in the business market.

- The current operational performance of the business firm is significantly influenced by the components of supply chain collaboration such as decision synchronization, incentive alignment and electronic data interchange. Therefore, the management of the company has to focus on these three components in its collaboration with the supply chain partners.

- Electronic data interchange has negative influence on the operational performance of the business firm. Therefore, the firm should decide in advance the type of information that would not have negative effect on its profitability when electronically shared with the supply chain partners.

- The definition and measures of supply chain collaboration and collaborative advantages can help managers to define specific actions to be taken collaboratively to improve shared supply chain processes that benefit all members (Wong, 1999; Lambert et al., 1999). The definition and measurements can serve as a powerful tool for managers to form effective collaborative relationships. They can also help firms to minimize the chance of collaboration failure by addressing these key dimensions before entering the collaborative relationship.

- In general, Firms seek to internalize the resources and skills of their collaborative partners to improve its performance. So managers need to be co-opetitive and balance the collaboration and competition. To collaborate well, firms need to work closely with partners to jointly create values that generate common benefits.

5.4.Limitation and future research

While the research has made significant contributions to research and practice, there are limitations that need to be considered when interpreting the study findings. Because of the limited number of observations (91), the revalidation of constructs was not carried out in this research. This needs to be addressed in the future research. New data may be collected to revalidate the measures and structural models.

Future research should also apply multiple methods to obtain data. The use of a single respondent to represent what are supposed to supply chain wide variables may generate some inaccuracy and More than the usual amount of random error. Future research should seek to utilize multiple respondents from each participating organization as an effort to enhance reliability of research findings. More insights will be gained by collecting information from both sides of the manufacturer–supplier dyad rather than just from one organization.

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Appendix A. Questionnaire

QUESTIONNAIRE

ADDIS ABABA UNIVERSITY

COLLEGE OF COMMERCE, SCHOOL OF GRADUATE STUDIES,

DEPARTMENT OF LOGISTICS AND SUPPLY CHAIN MANAGEMENT

Dear respondents:

I am Shawel Assfaw, a postgraduate student at Addis Ababa University, College of Commerce in the Department of Logistics and Supply Chain Management. Currently, I'm conducting a research entitled ***'The Effect of Supply Chain Collaboration Practices on Operational Performance: The Case of Heineken Brewery in Ethiopia"*** as a partial fulfillment of the requirements for in the degree of LSCM.

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. Your participation is entirely voluntary and the questionnaire is completely anonymous. I confirm you that the information you share will stay confidential and only used for the aforementioned academic purpose, thus not affects you in any way. So, your genuine, frank and timely response is vital for the success of the study. I want to thank you in advance for your kind cooperation and dedication of your precious time to fill this questionnaire.

Sincerely yours,

Shawel Assfaw

Note:

1.No need of writing your name.

2. Indicate your answer with a check mark (□) on the appropriate block.

Part I: Respondents Profile:

1. Age: □ 18-25 years □ 26-35 years □ 36-45 years □ above 45 years
2. Sex: □ Male □ Female
3. Educational Qualification:

□ Below college diploma □ College diploma □ First Degree (BSc, BA)

□ Second Degree (MSc, MA) □ PHD and above

4. Current Position_____

5. Year of service in the current position:

□ 1 to 3 years □ 4 to 7 years □ 8 to 10 years □ above 10 years

Part II: Assessment of Supply Chain collaboration Practices

1. Please indicate the degree to which you agree with the following statements concerning the practice

   Indicate your choice by putting the tick mark (□) on the appropriate cell or block.

   Where, (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree 6. Do not know).

Note: Please circle the number of your choice!

Section A*:* Information sharing.

1.1. Our firm and supply chain partners exchange relevant information	1	2	3	4	5	6
1.2. Our firm and supply chain partners exchange timely information	1	2	3	4	5	6
1.3. Our firm and supply chain partners exchange accurate information	1	2	3	4	5	6
1.4. Our firm and supply chain partners exchange complete information	1	2	3	4	5	6
1.5. Our firm and supply chain partners exchange confidential information	1	2	3	4	5	6

Section B; Decision synchronization

1.6. Our firm and supply chain partners jointly plan on promotional events	1	2	3	4	5	6
1.7. Our firm and supply chain partners jointly develop demand forecasts	1	2	3	4	5	6
1.8. Our firm and supply chain partners jointly manage inventory	1	2	3	4	5	6
1.9. Our firm and supply chain partners jointly plan on product assortment	1	2	3	4	5	6
1.10. Our firm and supply chain partners jointly work out solutions	1	2	3	4	5	6

Section C; Incentive Alignment

1.11. Our firm and supply chain partners has Co-develop systems to evaluate and publicize each other's performance (e.g. key performance index, scorecard and the resulting incentive);	1	2	3	4	5	6
1.12. Our firm and supply chain partners Share costs (e.g. loss on order changes);	1	2	3	4	5	6

1.13. Our firm and supply chain partners Share any risks that can occur in the supply chain; and	1	2	3	4	5	6
1.14. The incentive for our firm commensurate with our investment and risk.	1	2	3	4	5	6

Section D; Assessment of Electronic Data Interchange

1.15. Our Company creating linkage with suppliers through information technology.	1	2	3	4	5	6
1.16. Our Company creating linkage with customers through information technology.	1	2	3	4	5	6
1.17. Our Company has implemented application integration among internal functions.	1	2	3	4	5	6
1.18. Our Company employed integrative inventory management.	1	2	3	4	5	6
1.19. Our Company has implemented data integration among internal functions.	1	2	3	4	5	6

Section E; Assessment of Operational performance

1.20. Our Company SCC Strategy ensure high quality	1	2	3	4	5	6
1.21. Our Company SCC Strategy enhance flexibility	1	2	3	4	5	6
1.22. Our Company SCC Strategy improve customer service	1	2	3	4	5	6
1.23. Our Company SCC Strategy advance delivery speed	1	2	3	4	5	6
1.24. Our Company SCC Strategy increases cost performance	1	2	3	4	5	6

PART III: OPEN-ENDED QUESTIONS

1. In your own opinion what do you think the organization practices in the SCC effectiveness and efficiency?

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…….

2. In your opinion, how do you think the collaboration practice in your organization leads/ contributes to the organization performs?

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…….

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……..

3. Please make any general comments on the above

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……

……

4. Others – Please specify

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…….....

Thank you for your cooperation!