

ADDIS ABABA UNIVERSITY
COLLEGE OF BUSINESS AND ECONOMICS
DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION

FACTORS AFFECTING SUPPLY CHAIN PERFORMANCE IN THE TRANSPORT FUNCTION (THE CASE STUDY OF CCBA-ETHIOPIA)

BY: RAHEL FUJE MOSHE
ADVISOR: DR. YOHANNES WORKAFERAHU

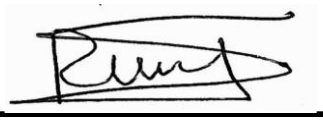
A THESIS SUBMITTED TO ADDIS ABABA UNIVERSITY, COLLEGE OF BUSINESS AND ECONOMICS, DEPARTMENT OF MASTER OF BUSINESS ADMINISTRATION, IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (MBA)

JUNE, 2026
ADDIS ABABA, ETHIOPIA

DECLARATION

This is to declare that the thesis is a result of my original work entitled "Factors Affecting Supply Chain Performance in the Transport Function: The Case of CCBA-Ethiopia" has been carried out by me under the guidance and supervision of Dr. Yohannes Workaferahu (PhD) and submitted to Addis Ababa University, College of Business and Economics, Department of Master of Business Administration in partial fulfillment of the requirements for the degree of MBA. This thesis has not been presented for a degree in any other university. All sources of materials used for the thesis have been acknowledged.

Declared By _____Rahel Fuje_____

Signature: _____ 

Date: June, 2026

ADVISOR'S CERTIFICATION SHEET

This is to certify that the thesis entitled "Factors Affecting Supply Chain Performance in the Transport Function: The Case of CCBA-Ethiopia" is an original work carried out by Rahel Fuje under my guidance and supervision. To the best of my knowledge, this thesis has not been submitted to any other university or institution for the award of any degree or diploma.

Name of Advisor: Dr. Yohannes Workaferahu (PhD)

Signature: 

Date: June, 2026

Addis Ababa University

College of Business and Economics

Department of Business Administration (MBA) Program

APPROVAL CERTIFICATION

This is to certify that the thesis entitled "Factors Affecting Supply Chain Performance in the Transport Function (*The Case Study of CCBA-Ethiopia*)*",* submitted to Addis Ababa University for the award of the Degree of Master of Business Administration (MBA) and is original research work carried out by Rahel Fuje. I hereby declare that no part of this thesis has been submitted to any other university or institution for the award of any degree or diploma.

Approved by:

- **Major Advisor**

Name **Dr. Yohannes Workaferahu (PHD)** **Signature** _____ **Date** **June, 2026**

- **Internal Examiner**

Name **Dr. Birhanu Tsegaye (PHD)** **Signature** _____ **Date** **June, 2026**

- **External Examiner**

Name **Dr. Tamiru Feyissa (PHD)** **Signature** _____ **Date** **June, 2026**

ACKNOWLEDGEMENT

My deepest gratitude is sent to the Almighty God, who has helped me in completing this research thesis. Second, I would like to express my heartfelt gratitude to my Advisor Yohannes Workaferahu. (PHD) for his continuous tolerance, support, guidance and motivation throughout the thesis progress and completion. Next, East Africa Bottling Share Company team (CCBA) is for the willingness they showed me to help me get access to relevant data needed for the success of the study. Furthermore, I would like to appreciate my family, my friends and my colleagues who are always with me in all conditions, for all their supports and guidance.

ABSTRACT

This study examined the factors influencing supply chain performance in the transportation function of Coca-Cola Beverages Africa Ethiopia. Specifically, the study investigated the effects of Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination on Supply Chain Performance. A quantitative research approach and census research design were employed. Data were collected from employees involved in supply chain-related activities at the Addis Ababa Plant. Of the 163 questionnaires distributed, 120 valid responses were obtained, yielding a response rate of 73.6%.Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4. The measurement model assessment confirmed acceptable indicator reliability, with most factor loadings exceeding 0.708. Convergent and discriminant validity were established, as AVE values exceeded 0.50 and HTMT values remained below 0.90. Furthermore, multicollinearity was not a concern, as all VIF values were below 5. The structural model demonstrated moderate explanatory power, explaining 37.3% of the variance in Supply Chain Performance ($R^2 = 0.373$; Adjusted $R^2 = 0.351$). Predictive relevance was confirmed through a positive Q^2 value. Effect size analysis indicated that Information Sharing had the strongest effect on Supply Chain Performance. The bootstrapping results revealed that Information Sharing ($\beta = 0.299$, $p = 0.001$) and Transport Responsiveness ($\beta = 0.270$, $p = 0.002$) had positive and statistically significant effects on Supply Chain Performance. In contrast, Lead Time Efficiency ($\beta = 0.116$, $p = 0.229$) and Transport Coordination ($\beta = 0.164$, $p = 0.095$) showed positive but statistically insignificant effects. The study concludes that Information Sharing and Transport Responsiveness are the primary drivers of Supply Chain Performance at CCBA Addis Ababa Plant. Accordingly, the hypotheses relating to Information Sharing and Transport Responsiveness were supported, whereas those relating to Lead Time Efficiency and Transport Coordination were not supported. The study recommends strengthening information-sharing mechanisms and enhancing transportation responsiveness to improve supply chain performance.

Keywords: Supply Chain Performance, Information Sharing, Transport Responsiveness, Lead Time Efficiency, Transport Coordination, PLS-SEM, CCBA Ethiopia.

TABLE OF CONTENTS

Contents **Page**

DECLARATION i
ADVISOR'S CERTIFICATION SHEET ii
ACKNOWLEDGEMENT iv
ABSTRACT v
TABLE OF CONTENTS vi
LIST OF TABLES ix
LIST OF FIGURES x
LIST OF ABRIVATIONS AND ACRONYMS xi
CHAPTER ONE 1
INTRODUCTION 1
1.1 Background of the Study 1
1.2 Statement of the problem 2
1.3 Basic Research Questions 4
1.4 Objectives of the study 4
1.4.1 General objectives 4
1.4.2 Specific objectives 4
1.5 Hypothesis Test 4
1.6 Scope of the Study 5
1.7 Significance of the Study 5
1.8 Limitation of the Study 6
1.9 Ethical Considerations 6
1.10 Organisation of the paper 7
CHAPTER TWO 8
LITERATURE REVIEW 8
2.1 Introduction 8
2.2 Theoretical Literature Review 8
2.2.1 Supply Chain Performance 9
2.2.2 Supply Chain Management and Performance 9
2.2.3 Transportation and Supply Chain 11
2.2.4 Key categories of Supply Chain Management 14
2.2.5 Fast-Moving Consumer Goods Manufacturers (FMCG) 16
2.3 Empirical Literature Review 17
2.3.1 Supply Chain Practices and Organizational Performance 17
2.3.2 Transportation and Supply Chain Performance 19
2.3.3 Information Sharing and Supply Chain Performance 19

2.3.4 Coordination and Supply Chain Integration 20
2.3.5 Application of SmartPLS in Supply Chain Studies 20
2.4 The Research Gap 21
2.5 Conceptual Framework 21
CHAPTER THREE 22
RESEARCH METHODOLOGY 22
3.1 Introduction 22
3.2 Description of the Study Area 22
3.2.1 Current Transport function 23
3.3 Research Approach 25
3.4 Research Design 25
3.5 Population and Sampling Techniques 25
3.5.1 Target Population 25
3.5.2 Sample size determination 26
3.6 Data Collection Instruments 26
3.6.1 Primary Data Sources 26
3.6.2 Secondary Data Sources 27
3.5.3 Pilot Testing of the Research Instrument 28
3.7 Data Processing 28
3.8 Methods of Data Analysis 29
3.9 Hypothesis 29
3.10 Validity and Reliability of the Measurement Model 30
3.10.1 Indicator Reliability 30
3.10.2 Discriminant Validity 30
3.10.3 Multicollinearity Assessment 30
3.11. Ethical considerations 31
CHAPTER FOUR 32
DATA PRESENTATION AND ANALYSIS 32
4.1 Introduction 32
4.2 Response Rate Analysis 32
4.3 Demographic Characteristics of the Respondents 33
4.3.1 Gender of respondents 34
4.3.2 Age of respondents 34
4.3.2 Marital Status of respondents 35
4.3.3 Educational Qualification of Respondents 35
4.3.4 Work Experience of Respondents 35
4.3.4 Division/ Position of respondents 35
4.4 Measurement Model Assessment 35

4.4.1 Indicator Reliability (Outer Loadings) 35
4.4.2 Discriminant Validity Using Fornell-Larcker Criterion 37
4.4.3 Discriminant Validity Using HTMT Ratio 37
4.4.4 Collinearity Assessment (VIF) 38
4.5 Structural Model Assessment 39
4.5.1 Coefficient of Determination (R^2) 39
4.5.2 Effect Size (f^2) 40
4.5.3 Path Coefficients and Bootstrapping Results 40
4.6 Hypothesis Testing 41
4.7 Discussion of Findings 42
4.7.1 Lead Time Efficiency and Supply Chain Performance 42
4.7.2 Transport Responsiveness and Supply Chain Performance 42
4.7.3 Information Sharing and Supply Chain Performance 43
4.7.4 Transport Coordination and Supply Chain Performance 43
4.7 Structural model 44
4.8 TAT Trend and Cost Analysis (CY vs PY) 46
4.9 Summary of Open-Ended Questions 46
CHAPTER FIVE 47
SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS 47
5.1 Introduction 47
5.2 Summary of Major Findings 47
5.2.1 Information Sharing 47
5.2.2 Transport Responsiveness 48
5.2.3 Lead Time Efficiency 48
5.2.4 Transport Coordination 48
5.2.5 Explanatory Power of the Model 48
5.3 Conclusion, Limitations, and Recommendations 49
5.3.1 Conclusions 49
5.3.2 Recommendations 50
5.5 Contribution of the Study 51
5.6 Limitations of the Study 51
5.7 Suggestions for Future Research 52
REFERENCES 53
APPENDIX A 55
APPENDIX B 59

LIST OF TABLES

Table **Page**

Table 1Current TAT Trend and Cost Analysis....24
Table 2 Questionnaire Response Rate....33
Table 3 Demographic characteristics of the respondents....34
Table 4 Outer Loadings of Measurement Items....36
Table 5 Fornell-Larcker Criterion....37
Table 6 HTMT Ratio....37
Table 7 Variance Inflation Factor (VIF)....38
Table 8 R-Square Results....39
Table 9 Effect Size Results....40
Table 10 Path Coefficients and Bootstrapping Results....40
Table 11 Summary of Hypothesis Testing Results....41
Table 12 Results of Measurement Model and Structural Model....45

LIST OF FIGURES

Figure 1 Conceptual framework of the Study 21
Figure 2 Description of the Study Area 23
Figure 3 Trend of transport lead time at AA 25
Figure 4 Questionnaire response rate 33
Figure 5 Structural Model Results 44

LIST OF ABRIVATIONS AND ACRONYMS

AA	Addis Ababa
ANOVA	Analysis of Variance
OP	Organizational Performance
EABSC	East Africa Bottling Share Company
FIFO	First in first out
TAT	Tuck Turnaround time
FMCG	Fast Moving Consumer Goods
H	Hypothesis
HDV	Heavy Duty Vehicle
IV	Independent Variable
LTL	Less than truck load
LTE	Lead Time Efficiency
MDV	Medium Duty Vehicle
OCCD	Official Coca Cola Distributor
β	Path Coefficient
SC	Share Company
PLS-SEM	Statistical atrial Least Squares Structural Equation Modeling
R^2	Coefficient of Determination
TL	Truck load
Smart PLS	Smart Partial Least Squares Software
VIF	Variance Inflation Factor

CHAPTER ONE
INTRODUCTION

1.1 Background of the Study

The existence of the global economy and stiff competition has forced organizations to understand the significance of SCM in gaining competitive advantage. SCM has helped organizations increase their organizational effectiveness by improving customer value, using resources effectively, and profitability (Lee, 2000). This has seen many organizations adopt SCM to gain competitive advantage and improve operational performance.

Traditionally, supply chains were thought of as processes that convert raw materials into goods and distribute them to customers. Today, the concept of supply chain management is broader in that it looks at the supply chain as an integrated process that includes suppliers, manufacturers, distributors, and customers (Christopher, 2016). For SCM to be successful, there has to be coordination and collaboration among all parties involved in the supply chain process (Frohlich & Westbrook, 2001).

Performance measurement is a crucial part of supply chain management. According to Harrington (1991), it is impossible for organizations to manage what they do not measure. In relation to supply chain management, measuring performance should not only focus on the performance of internal activities but also the performance expectations of suppliers, distributors, and customers (Normann & Ramírez, 1993).

The process of transportation is very critical in the operation of the supply chain because it ensures that raw materials and final products are moved within the supply chain effectively. Good transportation processes help lower the cost of operations, improve deliveries and customer satisfaction. On the other hand, deficiencies in the process of transportation and logistics result in high costs, delays and poor quality services (Chopra & Meindl, 2019). As a result, transportation has become a crucial factor influencing the performance of supply chains.

The Fast Moving Consumer Goods (FMCG) industry relies heavily on supply chain processes because of the nature of perishability of products and the demand for such products. In the beverages industry which is part of the FMCG industry, there is high competition in the industry where companies experience market pressures to cut costs and maintain supply of goods (Nolan, Zhang, & Liu, 2007). This means that supply chain processes are very crucial in maintaining competitiveness in the beverages industry. Coca-Cola Beverages Africa (CCBA) Ethiopia has

been operating in Addis Ababa for over sixty years and has made itself known as a major beverage producer and distributor in the nation. The organization runs a complicated supply chain that includes procurement, manufacturing, warehousing, transporting, and distribution processes. The success of the above activities is contingent upon integration and coordination of the supply chain functions. There are certain elements such as information exchange, transport responsiveness, lead-time efficiency, and transport coordination which can greatly impact the performance of supply chains.

Despite the critical nature of transportation in the functioning of supply chains, companies still have certain difficulties connected with delivery efficiency, responsiveness, information sharing, and coordination among supply chain partners. Knowing how those factors affect supply chain performance is very important for achieving operational success and competitiveness. For this reason, this paper explores factors affecting the performance of supply chain in the transportation process at Coca-Cola Beverages Africa (CCBA), Addis Ababa Plant.

In the current cut-throat business world, supply chain performance has emerged as one of the key drivers of organizational success. The organization is expected to provide its products to its consumers with great speed, reliability, and low cost and high levels of service delivery. For the realization of this objective, there must be proper coordination of the transportation function, communication, logistics management, and other processes in the supply chain process. Thus, there has been great effort put by the organization to boost their supply chain performance. This is especially true for manufacturing industries such as the beverages industry.

Despite the well-known importance of performance in the supply chain, firms continue to face challenges in the form of transportation delays, communication problems, coordination problems, and the inability to react to changes in customer requirements. These can disrupt the process of product movement, increase costs, and worsen the quality of service. Hence, it is vital for businesses to have knowledge about the major factors influencing the performance of the supply chain so that they could enhance their performance and competitiveness. In this regard, the study of the role of lead time efficiency, transportation responsiveness, information transfer, and transportation coordination can be quite helpful for managers.

1.2 Statement of the problem

The inefficiency in supply chain processes in developing nations like Ethiopia is mainly caused by structural and procedural problems that hinder logistics performance and supply chain processes (Fekadu, 2013; Recent Logistics studies, 2021-2024). The inefficiencies in logistics processes are some of the concerns that persist in current supply chain management studies.

The inefficiencies associated with logistics in the production of beverages include inefficiencies related to transportation processes like delays in deliveries, low flexibility, lack of tracking systems, and expensive transport services (Zeynu, 2020; Recent Beverage logistics studies, 2022-2024). These inefficiencies lead to imbalances in stock levels and other issues in the logistics process.

The problems that arise during transport in the beverages manufacturing industry include delayed delivery, inflexibility, poor tracking system, and high transport costs, which lead to unreliable supply chain management (Zeynu, 2020; Recent beverage logistics research, 2022–2024). These inefficiencies in transport finally lead to stock shortages, operational costs, damaged products, and low customer satisfaction.

As far as CCBA-Ethiopia is concerned, transportation is a key part of both forward and reverse logistics where the main tasks are the gathering and returning of empty bottles to be used again in the manufacturing process. In this regard, inefficiency in the operation has led to a high delay with an average of 74 hours (or three days) for each truck to finish their work. In this sense, there is a higher reliance on rented trucks that cost the organization 59,355,042 ETB per month (assuming nine trucks per day).

Additionally, poor logistics performances lead to poor performances in the supply chain activities such as inventory management, warehousing, and production continuity through reverse logistics delays and damage on returned bottles, which leads to increased costs of production due to the need for replacements, as well as disrupts the consistent supply of materials for manufacturing purposes. These challenges result in stock shortages or surpluses, high cost of storage, and poor service delivery to the distributors and final customers.

Past studies on the relationship between transport and performance in supply chain have revealed mixed results concerning the level of the relationship, its direction, and even the impact on manufacturing firms (Chow et al., 1994; Gunasekaran et al., 2004; Stefanovic, 2014; Recent empirical studies, 2021–2024). Moreover, very few empirical studies have been conducted on how certain transport processes including lead time efficiency, transport responsiveness, information sharing, and coordination influence the performance in supply chains of beverage manufacturing firms in the CCBA-Ethiopia environment.

Hence, the purpose of this study is to evaluate the effect of lead time efficiency, transport responsiveness, information sharing, and transport coordination on the supply chain performance in CCBA-Ethiopia in order to generate empirical evidence from this context.

1.3 Basic Research Questions

1. What is the effect of Transport responsiveness on Supply chain Performance?
2. What is the effect of Lead Time Efficiency on Supply chain Performance?
3. What is the effect of Information Sharing update on Supply chain Performance?
4. What is the effect of Transport Coordination on Supply chain performance?

1.4 Objectives of the study

1.4.1 General objectives

The General objective of this study is to assess factors affecting Supply chain performance on transport function in the case of coca cola beverages Africa, Addis Ababa plant.

1.4.2 Specific objectives

1. To examine the effect of Transport responsiveness on Supply chain Performance.
2. To asses effect of Lead Time Efficiency on Supply chain Performance.
3. To investigate the effect of Information Sharing update on Supply chain performance
4. To identify the effect of Transport Coordination on Supply chain Performance.

1.5 Hypothesis Test

H1: The effect of Transport responsiveness has a significant positive impact on Supply chain Performance.

H2: The effect of Lead Time Efficiency has a significant positive impact on Supply chain Performance.

H3: The effect of Information Sharing has a significant positive impact on Supply chain Performance.

H4: The effect of Transport Coordination has a significant positive impact on Supply chain Performance.

1.6 Scope of the Study

The geographical boundaries of the study are confined to CCBA-Ethiopia, Addis Ababa Plant, where transportation is conducted among other logistical activities in the supply chain. The study population will be transportation and supply chain employees, who are involved in transportation and logistics activities. The conceptual basis of the study is to explore the effect of transportation-related factors on supply chain performance, where four main variables are selected, namely lead time efficiency, transport responsiveness, information sharing, and transport coordination. The reason behind selecting these variables is that they directly affect transportation performance in the supply chain. The methodological approach to the study is to examine the association between these selected transport variables and the supply chain performance. In this case, other functional departments apart from transportation logistics and factors influencing these variables are not considered in this study.

1.7 Significance of the Study

The significance of the present study lies in its combination of both primary and secondary data sources used to conduct a more detailed and accurate analysis of transport logistics and performance of the supply chain of CCBA-Ethiopia, especially Addis Ababa Plant. Given the problems associated with transport delays, high rental costs, poor coordination, and inability to share information, the findings presented in the current paper reflect practical reality of the operation process in the company. Therefore, the results of the study are very valuable for gaining insight into the impact of logistics inefficiencies on turnaround time, cost escalation, and the entire performance of the supply chain.

Another significance of the research lies in the fact that its findings can be used to create actionable managerial recommendations for enhancing the efficiency of operations and saving logistics costs of CCBA-Ethiopia. The results obtained during the course of the research can help the management to identify the problem areas in transport operations and develop new strategies for better coordination and planning. Additionally, the paper helps to enhance cooperation between supply chain partners. In addition, the study makes considerable contributions to various stakeholders.

To CCBA-Ethiopia, the study contributes towards the improvement of the efficiency of the entire supply chain. To supply chain partners, it helps to align and coordinate logistics operations. To managers and decision makers, it is helpful in providing useful information based on which decisions can be made.

To scholars and researchers, it contributes to the literature by providing practical experience gained from a developing country, especially in the beverage manufacturing industry in which integrated logistics plays an important role. To policy makers, the findings will be useful in formulating policies related to the efficient operation of the transport and logistics industry. Finally, to future researchers, it will be a good foundation for conducting research on the subject matter.

1.8 Limitation of the Study

The study can be affected by perception bias of the respondents because some answers can be affected by their perceptions, judgments, or opinions that can have an impact on the validity of the results, even though efforts were made to make sure that the data was clear during the collection. The second limitation is the narrow scope of variables that the research is based on since only selected transport logistics elements were considered, including lead time efficiency, transport responsiveness, information sharing, and coordination, but no other factors affecting the supply chain performance. The third limitation is related to the fact that the study is conducted at one plant – the AA Plant of CCBA-Ethiopia.

1.9 Ethical Considerations

Ethical considerations were strictly upheld throughout the process of conducting this study. Before conducting the survey, clearance will be sought from the concerned authorities of Coca-Cola Beverages Africa- Ethiopia. Each participant was fully informed of the purpose of the research, and his or her informed consent was duly sought before participation. Participation in the research was voluntary, and each individual had the freedom to refuse to participate in or leave the research at any time without being penalized. To protect the privacy of the participants, no names or other personal identification of any participant was included on the questionnaire or interview schedule. The responses gathered were for purely academic purposes and would not be released to any third party.

No physical, psychological, and professional harm is intended or caused to participants during the process of conducting the research. Honesty and objectivity were upheld during the process of collecting and analyzing data and writing the report. All information sources were cited to prevent plagiarism.

1.10 Organisation of the paper

This research proposal consists of four chapters. Chapter One provides an introduction to the research study and this includes the background, problem statement, objectives, scope, significance, and limitations of the research study. The second chapter contains a review of literature about factors that influence the performance of the supply chain and this chapter specifically highlights the transport function aspect of the supply chain. This chapter not only includes literature reviews but also includes the conceptual framework used in this study. The third chapter provides the methodology used in this study and this includes the research design, sources of data, population, sampling procedure, data collection, data analysis, and ethical considerations.

CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This chapter reviews relevant theoretical and empirical literature related to factors affecting supply chain performance in the transportation function. It focuses on key concepts, previous studies, and the conceptual framework of the study.

2.2 Theoretical Literature Review

The definition of the term supply chain (SC) varies in different pieces of literature. In ISO 28001:2007, supply chain is defined as an integrated system of resources and processes starting from the sourcing of raw materials and ending with delivering products and services to the end customers. In a similar vein, ISO 22095:2020 defines the supply chain as a process chain that encompasses the processes engaged in the manufacturing and delivery of goods from the point of origin to the end users. Finally, Monczka et al. (2002) define the supply chain as all operations associated with converting raw materials into final products through various processes and flows of information between upstream and downstream partners.

Sourcing, manufacturing, transporting, storing, and distributing are activities that make up the supply chain. These activities add value until the products are available for final consumers. The performance of the supply chain refers to the efficiency and effectiveness of operations within the supply chain in respect of cost, time, responsiveness, reliability, and customer satisfaction. Recent research stresses the role of the integration of activities by all supply chain participants in determining supply chain performance (Christopher, 2016; Mentzer et al., 2020; Kumar & Singh, 2022).

The literature abounds with empirical findings highlighting the role of supply chain management in improving organizational performance. Gunasekaran et al. (2004) highlighted delivery reliability, cost efficiency, flexibility, and responsiveness as some of the key aspects of supply chain performance. Likewise, Li et al. (2006) revealed that supply chain integration and information exchange contribute to improved efficiency and competitiveness. More recent research proves that both internal and external integrations help improve the performance of the supply chain by means of better coordination and responsiveness among supply chain participants (Wang et al., 2021; Sharma & Kumar, 2023).

2.2.1 Supply Chain Performance

Performance is associated with the degree of achievement of the set goals or targets in an efficient manner. In respect to the concept of supply chain management, performance in supply chains is described as the ability of the supply chain to accomplish goals or objectives relating to efficiency, responsiveness, flexibility, reliability, and customer satisfaction.

The main parameters for assessing supply chain performance include delivery performance, lead-time reduction, inventory level, service quality, and cost efficiency (Gunasekaran et al., 2004; Christopher, 2016; Chopra & Meindl, 2016). The high-performance supply chain is associated with the effective delivery of goods in sufficient quantities, at the right time, in good conditions, and at reduced cost (Ballou, 1999).

Logistics is essential for supply chain performance as it integrates procurement, production, storage, and delivery functions. Effective logistics operations positively impact customer service, minimize costs, and increase competitiveness. As a result, performance in supply chains is regarded as the important factor for performance of organizations due to its influence on financial and non-financial factors including profitability, market share, and customer satisfaction (Wheelen & Hunger, 2013; Chesire & Kombo, 2015).

2.2.2 Supply Chain Management and Performance

Definitions of supply chain management (SCM) abound both in literature and in the context of international standards. For instance, ISO 28001:2007 defines a supply chain as an interconnected series of resources and processes starting from procurement of the basic materials and continuing through manufacturing, handling, transportation and distribution until products are received by the final customers. In similar vein, ISO 22095:2020 defines it as an interconnected process for the manufacture and delivery of goods from origin to end use. Monczka et al. (2002) defined SCM as all activities involved in transforming and moving products and information from the source of raw materials to the end customers.

Performance of a supply chain can be defined as how well the chain is able to meet important goals such as cost effectiveness, responsiveness, flexibility, reliability, and customer satisfaction. The measures of performance usually include delivery performance, lead times, inventories, and quality of services (Gunasekaran et al., 2004; Christopher, 2016; Kumar & Singh, 2022). An effective supply chain guarantees the timely delivery of the right products to the right customers in the right quantity and at low cost (Chopra & Meindl, 2016; Ballou, 1999).

Logistics is very important in managing supply chain operations through the organization of activities relating to procurement, production, warehousing, and distribution so as to facilitate

easy flow of information and materials (Bowersox et al., 2002). The process of transport is an integral part of logistics as it entails movement of goods from one place to another through different means of transport such as road, rail, air, marine, and pipelines (Coyle et al., 2013; Christopher, 2016).

Well-managed transport leads to improved performance in terms of delivery services, low cost, and responsiveness. Recent research points out that efficient and coordinated transport greatly impacts supply chain performance, especially for manufacturing and fast-moving consumer goods industries that require proper timely delivery services and cost control (Sharma & Kumar, 2023; Paul et al., 2022; Wang et al., 2021). In terms of operations, both inbound logistics and outbound logistics are important aspects of supply chain performance. Inbound logistics entails the movement of raw material into the production plant whereas outbound logistics deals with the movement of the final product to the customers. Coordinating these activities cuts down lead time and costs while increasing customer satisfaction (Chopra & Meindl, 2016).

In conclusion the performance of supply chains in manufacturing firms like CCBA-Ethiopia largely depends on logistics and transportation performance.

Inbound and Outbound Logistics in Supply Chain Performance

Logistic activities are typically divided into two major areas of inbound logistics and outbound logistics that are equally important for improving supply chain operations (Coyle et al., 2013). Properly managing inbound and outbound logistics will result in more efficient processes, lower costs, and customer satisfaction.Inbound logistics is all about the delivery, handling, and storage of the raw materials and other resources supplied from outside to the production facilities. Inbound logistics will ensure that materials are available at the time needed, the cost of their acquisition is minimal, production interruptions are avoided, and the process is continuous (Christopher, 2016). On the other hand, outbound logistics deals with the storage, transportation, and distribution of finished goods from the production site to the customers.

These activities involve order processing, warehousing, transportation, and customer service. Good outbound logistics ensures that there is timely delivery, accuracy in order processing, and increased availability of the products, which consequently increases the level of customer satisfaction (Chopra & Meindl, 2016; Coyle et al., 2013).For manufacturing firms such as CCBA-Ethiopia, the effective coordination of both inbound and outbound logistics is crucial in ensuring smooth product flows, shorter lead times, cost efficiency, and improved supply chain performance. In recent times, research has indicated that the integration of inbound and outbound

logistics increases the responsiveness of supply chains and their efficiency (Kumar & Singh, 2022; Sharma & Kumar, 2023).

2.2.3 Transportation and Supply Chain

Transportation is an essential aspect of logistics and supply chain management since it is responsible for the movement of raw materials, work-in-progress goods, finished products, and returnable goods along the supply chain. Transportation adds value by making sure that the products are delivered at the right place at the right time in the required conditions. Thus, transportation is crucial in increasing the efficiency and effectiveness of the supply chain (Christopher, 2016; Coyle et al., 2013).

The performance of the supply chain is affected by the transportation through its effects on delivery speed, reliability, responsiveness, inventory, and logistics costs. Good transportation management will ensure that there are shorter lead times, better availability of products, efficient use of resources, and customer satisfaction. However, inefficiency in transportation may cause delivery delays, high costs of operations, damage of the products, and poor services. The current trend in logistics involves a multimodal transportation system that uses different modes like road, railway, air, and water transport to ensure flexibility and efficiency. Transportation works together with warehousing, inventory control, packaging, materials handling, and distribution processes. The benefits from this integration include cost reduction, increased reliability and effectiveness of the process (Ivanov & Dolgui, 2021; Sharma & Kumar, 2023).

Transportation plays a role in forward and reverse logistics functions in manufacturing firms like CCBA-Ethiopia through moving raw materials, finished products, and recyclable materials. Thus, transportation is not just a logistics function but a strategic one that has an impact on performance, quality of services and goods, customer satisfaction, and competitiveness (Wang et al., 2022).

The Effects of Transportation on Supply Chain Activities

Transportation forms an important part of logistics in the process of moving raw material, semi-finished products, and finished goods. In fact, it plays a crucial role in connecting suppliers, manufacturers, warehouses, distributors, and customers in the process of ensuring the continuous flow of goods from manufacture through delivery to customers. Thus, transportation has a significant role in improving the efficiency and effectiveness of the supply chain (Sreenivas & Srinivas, 2001).

Good transportation improves the performance of the supply chain by shortening delivery times, improving availability of the goods, reducing costs of logistics, and improving customer services. Transportation being an integral part of logistics management is closely linked to other areas of logistics such as warehousing, manufacturing, inventory control, and distribution. The present day SCM stresses on the integration of logistics processes involved, as compared to when production, transportations, and distributions are handled as separate processes. Integration of these processes helps an organization to optimize resource usage and improve the overall performance of the supply chain process. The transportation process is responsible for the transportation of raw materials to the production facilities, transportation of manufactured products to the customers, and transportation of returnables from customers back to the facilities. Thus, good transportation systems help an organization to coordinate better, save time, reduce costs, and increase customer satisfaction.

Thus, transportation is not just a process for carrying goods from one place to another, but is a supply chain process which impacts organizational competitiveness and supply chain performance (Christopher, 2016; Chopra & Meindl, 2019; Wang et al., 2022).

The Role of Transportation in Service Quality

Transportation is an essential element of logistics and makes a considerable contribution to the quality of services provided in the supply chain. This is because transportation ensures that the delivery of products is done to the right location, at the right time, and in the expected condition in order to satisfy customer needs. Transportation adds to service quality by way of timeliness, reliability, availability, and consistency in service delivery, thus resulting in higher customer satisfaction (Sreenivas & Srinivas, 2001; Christopher, 2016).

Transportation also solves the issues that arise due to time and geographic limitations that exist in the distance between production and consumption points. Through effective transportation of products from one place to another, it becomes possible to create time and place utility, thus ensuring that the product becomes available to consumers at the appropriate time. Also, transportation contributes to the performance of other logistics operations, such as warehousing, inventory management, packaging, and distribution. By coordinating all these operations efficiently, supply chain performance can be improved through the reduction of lead times, reduction of costs, and improvement of reliability. In this regard, transportation is seen to influence the quality of services and competitiveness in organizations (Ivanov & Dolgui, 2021; Wang et al., 2022; Sharma & Kumar, 2023).

To conclude, transportation affects the quality of services in terms of increasing the performance, responsiveness, and reliability of deliveries.

Key Supply Chain Activities Affecting Supply Chain Performance

1. Transportation

Transportation implies the physical transfer of the product from one place to another as the product travels from the start of the supply chain till it reaches its destination (Chopra& Meindel, 2007). The different ways in which the products are transported from one place to another are known as transport modes. The five basic modes of transportation include road transport, rail transport, air transport, water transport, and pipeline transport. Transportation acts as a link between the upstream partners (for example, raw material providers with manufacturers) and downstream partners (manufacturers with distributors/retailers/consumers) in the economic network Bureau of Transportation Statistics (2021).

The following are the desired transportation system capabilities:

- Enhanced physical goods monitoring
- Intelligent and sustainable utilization of resources (carriers and vehicles)
- Interconnected and smart transport infrastructure
- Collaborative digital platforms
- Knowledge transfer and information sharing
- Customer and business partner relationships
- Unlocking business risk prediction and forecast models via big-data technologies

In general, the transport logistics process plays a mediating role within the chain of supply as the means for the physical movement of commodities from the starting point that is the shipper to the endpoint, which is the consignee. Transport logistics firms carry out the physical task of distributing commodities from one place to another (Coyle et al., 1996). Therefore, the business operation involves parties beyond the organization itself, including the shipper and consignee.

2. Warehousing

According to Ghiani, Laporte and Musmanno, 2013 warehouse or storage place is a commercial structure that is made and fitted with standardized equipment depending on their purpose for use as means of ensuring the quality and quantity of the products held. The reason why there is need of having warehouse is the difference in time between product production and consumer use. Ala-Harja & Helo, 2015 Storage/Warehouse can be defined as keeping of products in safe custody before sending out to the consumer. Storage bridges this time difference hence making

time utility. It is important to understand that there is a need for storage of goods because there will be availability of the products as and when required by the consumer.

Warehouses make possible the storage of the commodities in case of surplus over demands and make them available again when demand is higher than immediate production. This not only helps in providing consistent availability of products in the market but also helps in stabilizing prices through proper balancing of the demand-supply equation. Warehousing enables organizations to avoid losses arising out of damages such as loss, spoilage, fire, theft, etc. Warehouses facilitate the processing, packaging, blending, and grading of goods for sale purposes. Large scale exporters/ manufacturers utilize the warehouse facility as a means of developing their retailing network.

3. Inventory Management

Inventory control is key to keeping optimum inventory quantities that will result in a balance between the cost and quality of service provided. Lack of good inventory control will result in either having too much stock, thereby increasing holding costs, or lack of stock, and in both cases, performance in the supply chain will be affected (Silver et al., 1998; Chopra & Meindl, 2016).

4. Order processing

Order processing, according to Donald (1996), is a phrase applied in reference to the aggregate of activities involved in completing an order made for goods or services by a customer. The processing process starts when the order request is accepted and ends when the customer receives all the products ordered and realizes the order was correctly made.

5. Materials Handling

Material handling entails the physical movement, storage, and control of materials in storage areas or production facilities. Materials handling increases efficiency through reduced damage, higher speeds in operations, and increased productivity (Coyle et al., 2013).

6. Packaging

Packaging is an essential logistics function aimed at protecting goods while they are stored or transported. As observed by Bowersox et al. (2002), efficient packaging ensures there is less damage to products, low number of returns, and customer satisfaction.

2.2.4 Key categories of Supply Chain Management

Whereas the value chain and marketing strategies provide general theories and skills, advocates of the supply chain concept take this one step further and specify particular actions, supported by a process through which a company may enhance its competitive edge and success. Supply chain

management involves managing a product or service from end-to-end (Hakanson, 2009). All items and goods need to be delivered to the manufacturing plants, distributors, and ultimately the consumer. Customer.

The decision regarding transport (by air, sea, or land) will influence other aspects of logistic activities, such as warehousing, production, packaging, planning, site selection, inventory control, and information management (Coyle, et al, 2006). Consequently, variables such as speed of delivery, reliability, access, security, effect on inventory, product deterioration, and trace-ability are critical considerations. Once the transportation mode has been chosen, computer models are developed to optimize routing. The efficiency of the shipping activity is a key strategy in achieving cost savings (Council of Logistics Management, 2001).

It has become necessary for businesses in recent times to effectively coordinate the process of returning goods because reverse logistics has become an important part of supply chains systems. Reverse logistics involves the movement of products from consumption back to the starting point for reasons such as product returns as a result of customer dissatisfaction, end-of-life activities, and recycling. According to Tibben-Lembke (2002), reverse logistics is primarily motivated by customer dissatisfaction and costs related to recycling. This operation has assumed greater significance in modern supply chains because of its effect on cost efficiency and performance.

The production and distribution process always starts with demand forecasting; however, this process is quite uncertain by its nature. The forecast errors may lead to two consequences – either an underestimate or overestimate of demand. An underestimate will cause missed sales opportunities, while an overestimate can cause excess stock. These uncertainties cause the famous "bullwhip effect", when the small changes in the demand at the retailers' end cause larger distortions in the higher parts of the supply chain. Lee et al. (1997) state that it causes overstocking, poor customer service, inefficient capacity planning and production scheduling problems. It still remains an important problem of supply chain management, especially in the cases of lagged and poorly coordinated information flow.

In order to deal with such problems, supply chain collaboration becomes necessary. While firms use to concentrate their activities on pushing their products into the market, modern supply chains need more coordinated planning and information flow between partners. Supply chain collaboration implies collaborative planning, performance measurement and decision making between companies (Anthony, 2008).

This collaboration alters the whole process of information exchange and internal operations of supply chain partners. Efficient collaboration is greatly aided by the provision of proper and up-to-date information on demand, which generally starts with Point of Sales (POS) information that

is communicated upwards to the manufacturer to aid in the decision of restocking. In turn, production planning and inventory management are more and more oriented towards sell-through information as opposed to traditional methods of forecasting (Poirier, 2009).

2.2.5 Fast-Moving Consumer Goods Manufacturers (FMCG)

The FMCG are those goods which are sold very quickly at a relatively low cost. Moreover, the FMCG can also be defined as those goods which are either essential or nonessential but which are consumed frequently (Mandrinos, 2014). Many goods belong to the category of FMCGs, and these include soap, shaving creams, toiletries, detergents, carbonated drinks, processed foods, consumables, glass, batteries, beauty goods, and plastics goods among others (Wasonga, 2012). The shelf life of the FMCG products is very short, and the reason behind the short shelf life of FMCG products is because most of the FMCG goods are perishable and spoil within a very short period. This includes those FMCG products like fruits, meat products, bakery, and vegetables. From the marketers' perspective, FMCG have an extensive distribution system (Nyaga, 2014).

The FMCG are highly associated with the day-to-day activities of people, as most of the FMCG are the food goods, personal care and household goods, and the pharmaceutical goods. Hence, the supply chain of the FMCG comprises a long supply chain structure, fast operational speed, and diversity of goods in the supply chain.

In developed areas, such as Europe and North America, supply chain management principles have been extensively applied in order to improve the efficiency and effectiveness of all links in the supply chain network. There exists extensive cooperation and sharing of resources among upstream and downstream firms in all stages of the supply chain process – from supplying raw materials to manufacturing, transporting, distributing, selling and offering post-sale services.

On the other hand, even though FMCG industries in developing countries, such as China, possess great room for expansion and substantial consumer base, the use of information systems in the supply chain process is far from being well-developed in many enterprises. There is inadequate exchange of information between upstream and downstream suppliers, and even in-house departments, such as sales and manufacturing, experience certain problems when it comes to exchanging information.

The distribution channel for FMCG is the coordinated series of processes and the associated resources. The manufacturer, the warehouse, the supplier, the logistics company, the wholesaler, the distributor, and every other entity within the supply chain are involved.

In many of the links involved in the provision of raw materials, manufacturing, transport, distribution, sales, and after-sales service for fast-moving consumer goods, the sharing of resources between the upstream and downstream enterprises have been successfully achieved.

Fast moving consumer goods are a typical example of the mass consumer markets. The diversity of products, market competition, lack of brand loyalty, and the long supply chain makes it essential for the supply chain of fast moving consumer goods to be able to quickly adapt to changes in the demands of its end consumers. On the other hand, in spite of the growing market competition, the fast moving consumer goods enterprises must the fast moving consumer goods industry is a typical mass consumer market.The wide range of fast moving consumer goods, intense competition, low consumer loyalty, and length of product chain demand that the fast moving consumer goods chain should react swiftly to changing requirements of consumers.

2.3 Empirical Literature Review

This section provides empirical data gathered from earlier research done on various activities and approaches adopted by supply chain management systems and the impact thereof on the performance of the supply chains. The main emphasis will be on transportations, sharing of information, coordination, and integration. This differs from theory in that there is actual data provided.

2.3.1 Supply Chain Practices and Organizational Performance

Several empirical studies on supply chain management have been undertaken mainly in order to find out which kinds of logistics and coordination practices affect organizations' performance in a significant way. The vast majority of such studies rely on the use of quantitative methods, including regression analysis and structural equation modeling approaches, including SmartPLS, which is widely used now. For instance, Gunasekaran et al. (2004) carried out one of the first empirical studies on measuring supply chain performance and concluded that performance measures should include not only strategic but also operational factors, such as delivery reliability, lead time, cost effectiveness, and responsiveness.

Moreover, Li et al. (2006) have empirically evaluated the impact of various supply chain management practices on performance measures in the manufacturing industry and proved that the higher the coordination degree within supply chains, the better their responsiveness and competitive advantages.

Relatedly, a study by Flynn et al. (2010), based on survey-based data, explored the effects of internal and external integration on organizational performance. According to their findings,

internal integration between departments leads to enhanced efficiency while external integration with suppliers and customers helps to increase supply chain responsiveness.

In more recent studies on the supply chain, researchers have adopted PLS-SEM modeling to analyze various factors involved in the process. For example, Hair et al. (2017) note that SmartPLS is especially useful in supply chain management because of its ability to incorporate several independent and dependent factors simultaneously, regardless of the size of the samples. Research also shows that transport efficiency is essential in enhancing supply chain effectiveness. Gimenez and Ventura (2005) observed that firms that have highly efficient logistics and transport systems tend to exhibit less delivery time and customer satisfaction

In addition, Lee et al. (2000) demonstrated that lack of information sharing across supply chain partners leads to inefficiencies such as the bullwhip effect, which increases inventory costs and reduces responsiveness. Their study highlights the importance of real-time information flow in achieving supply chain stability and efficiency.

For instance, more contemporary studies like that of Ali et al. (2018), which used SmartPLS, have found that supply chain integration and information sharing have a significant effect on organization performance, especially within manufacturing contexts.

Despite all this, most of the empirical works done on this topic have been carried out in developed countries and large-scale industries without much attention being given to the performance of FMCG manufacturing industries within developing nations like Ethiopia. Moreover, there are very few empirical studies that have considered the combination of various factors in a supply chain together in predicting its performance using SmartPLS. Hence, this study builds on existing empirical research work to test the effects of some key supply chain practices on its performance in the CCBA of Ethiopia.

According to Gunasekaran et al. (2004), a framework for measuring the supply chain performance was developed, which found out that delivery reliability, cost efficiency, flexibility, and responsiveness were the most critical factors that determine the performance of supply chain processes. The authors' finding underscores the fact that the measures for both financial and operation aspects need to be included when assessing the efficiency of supply chains.

Li et al. (2006) studied the effect of supply chain management practices on the performance of organizations based on the surveys conducted on manufacturing companies. Results showed that supply chain integration, development of long-term partnerships, and information sharing were the major factors influencing the success of manufacturing organizations. Also, Flynn et al. (2010) noted that internal and external integrations were the key drivers in improving supply chain efficiency.

2.3.2 Transportation and Supply Chain Performance

It has been widely acknowledged that transportation plays a crucial role in supply chain management since it determines cost, delivery time, and the level of service. From Coyle et al., the effectiveness of transport systems implies low cost of logistics and high customer satisfaction resulting from punctual and regular distribution of goods. Gimenez and Ventura have done some research in the area and noted that effective logistics and transport systems help firms perform better as they are able to deliver services fast.

Further, the two researchers have noted that firms with efficient transportation systems have fewer stockpiles because of improved efficiency of distribution. A major drawback results from inefficiency of logistics operations. This has been shown to cause various supply-related challenges. For instance, Mentzer et al. revealed that inefficient logistic systems lead to increased cost and delayed delivery to consumers in less developed countries. It is clear that there are numerous complications associated with inefficient logistics and transport systems, which affect organizations as well as their supply chains.

2.3.3 Information Sharing and Supply Chain Performance

Information sharing involves the timely and accurate exchange of information among supply chain participants to facilitate planning and coordination. Through information sharing, companies can create visibility along the entire supply chain and foster cooperation between the various supply chain players such as suppliers, manufacturers, distributors, and consumers. Information sharing allows organizations to be proactive when responding to market changes and consumer needs, among others (Ivanov & Dolgui, 2021).

The practice of information sharing makes a considerable contribution to the efficiency of operations carried out by supply chains since it leads to lower uncertainty levels, better demand forecasting, improved inventory control, and efficient use of resources. With the help of information sharing among supply chain members, it is possible to enhance coordination, reduce lead times, lower costs, and increase service levels (Dubey et al., 2021; Queiroz et al., 2022).

According to recent empirical research findings, there exists a direct correlation between information sharing and supply chain effectiveness. According to Wang et al. (2021), information sharing increases coordination, efficiency, and delivery. In the same way, Sharma and Kumar (2023) revealed that information sharing results in an increased level of responsiveness, flexibility, and customer satisfaction in the supply chain process. Moreover, according to Dubey et al. (2021), information sharing makes the supply chain resilient.

As stated by Lee et al. (2000), the absence of timely information exchange among various participants in the supply chain process is responsible for the phenomenon referred to as the bullwhip effect. The bullwhip effect makes the process more expensive due to increased inventories. To support this point, Chopra and Meindl (2016) assert that real-time information sharing facilitates accurate demand prediction, decreases uncertainty, and facilitates supply chain coordination.

Kim and Lee did a study in 2010. They found out that when people share information it really helps the supply chain work better and be more flexible. This is also good for the performance of the supply chain. Kim and Lee used a method to analyze the results and this method showed that information sharing is very important, for supply chains. It should be noted that their findings support the assertion that organizations that invest in information technology enjoy higher levels of supply chain integration and agility.

2.3.4 Coordination and Supply Chain Integration

The term 'supply chain coordination' involves the harmonizing of operations and decisions made by various supply chain partners toward mutual objectives. According to Simatupang and Sridharan (2005), coordination contributes significantly towards efficient resource management, minimizes overlap in functions and ensures improved performance of supply chains.According to Arshinder et al. (2008), coordination between suppliers and manufacturers contributes significantly to enhanced reliability, minimized lead time and effective cost management within the supply chains.Conversely, it can be argued that coordination acts as an important determinant of operational efficiency in supply chains. Additionally, Flynn et al. (2010) indicate that companies which exhibit high levels of integration and coordination perform better as a result of their ability to meet customer requirements.

2.3.5 Application of SmartPLS in Supply Chain Studies

In the recent past, Partial Least Square Structural Equation Modeling (PLS-SEM) has been applied broadly in supply chain management research because of its capacity to analyze complex models and small samples, among others. According to Hair et al. (2017), PLS-SEM is particularly suited to exploratory research, which seeks prediction and theory development. Additionally, PLS-SEM can be applied effectively in cases where latent variables such as transportation efficiency, responsiveness, and performance of the supply chain are involved.

Research articles such as Ringle, Sarstedt, and Straub (2012) show that it is possible to use SmartPLS to investigate the causal relationship between several constructs even when the data

are not normally distributed.Ali et al. (2018) also used PLS-SEM to establish that supply chain integration and information sharing lead to improved performance of the organization. This means that SmartPLS is capable of analyzing supply chains in practical settings.

2.4 The Research Gap

Past studies that have looked at the elements of supply chain and transport logistics have considered the impact of several elements such as lead time efficiency, transport coordination, information flow, and responsiveness on supply chain performance. The conclusions made by the past studies do not necessarily agree, and their relationships may be interpreted differently based on different circumstances.Further, most of the past literature has looked at issues in general manufacturing or logistics industries rather than focusing specifically on integrated beverage supply chains where forward and reverse logistics are equally important. As such, the exact impact of any form of transport-related inefficiencies on supply chain performance in contexts such as that of CCBA-Ethiopia is yet to be well understood. Consequently, this study is meant to fill the void through an empirical study of CCBA-Ethiopia.

2.5 Conceptual Framework

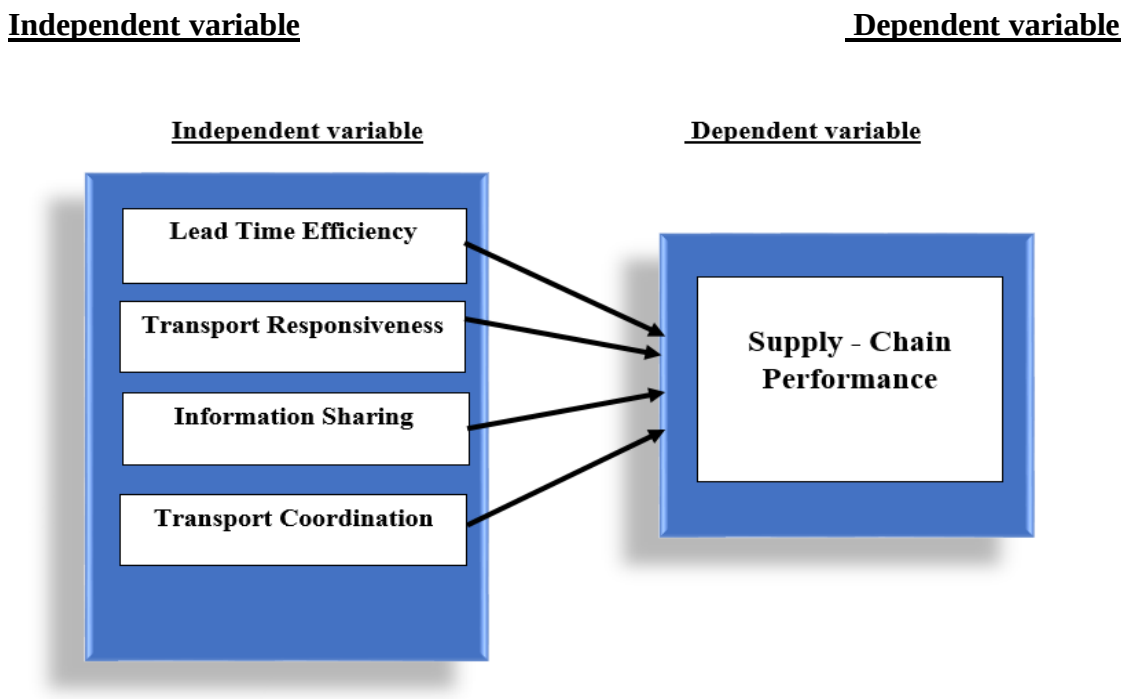


Figure 1 Conceptual framework of the Study

Source: Developed by the researcher based on literature review

CHAPTER THREE
RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the methodology employed in the study. It describes the procedures used to conduct the research, including the research design, target population, sampling techniques, data collection methods, and data analysis procedures. The chapter also explains the measures taken to ensure the reliability and validity of the data collected. In addition, ethical considerations and procedures used to enhance the credibility of the findings are discussed. Overall, this chapter provides a comprehensive description of the methodological approach adopted to investigate the factors affecting supply chain performance in the transportation function.

3.2 Description of the Study Area

The East Africa Bottling Share Company, which is a part of the Coca-Cola Beverages Africa group is a name in the beverage industry in Ethiopia. The East Africa Bottling Share Company has been around for than sixty years and it makes and sends out Coca-Cola products all over Ethiopia.The East Africa Bottling Share Company has factories, including ones in Addis Ababa, Sebeta, Bahir Dar and Dire Dawa and it also has a store in Mekelle. This helps the East Africa Bottling Share Company serve a lot of people through its network. The East Africa Bottling Share Company is important for the food. Drink industry in Ethiopia and it helps create jobs and grow industries.

Because the East Africa Bottling Share Company makes a lot of products and sends them all over the country it needs a system for getting things from one place to another. The East Africa Bottling Share Company has to manage its transportation so that products get to customers on time and in the right amounts.If the East Africa Bottling Share Company does transportation well it can make sure products are always available cut costs and make its whole system better. So the East Africa Bottling Share Company is an example to look at when thinking about what affects how well the supply chain works, especially when it comes to moving things around in the manufacturing industry, in Ethiopia. The Addis Ababa plant is one of the Coca-Cola production facilities in Ethiopia. It has been very important for the company since they started bottling Coca-Cola in the country. The Addis Ababa plant is a place where they make and send out Coca-Cola to Addis Ababa and the areas around it. They have a system to transport and give out the drinks. The Addis Ababa plant has been made bigger.

Improved many times to make it work better. They even got machines that can fill plastic bottles, which helped them make more drinks and work more efficiently. The Coca-Cola production facilities like the Addis Ababa plant are always trying to get better. The Addis Ababa plant is a part of Coca-Cola, in Ethiopia.

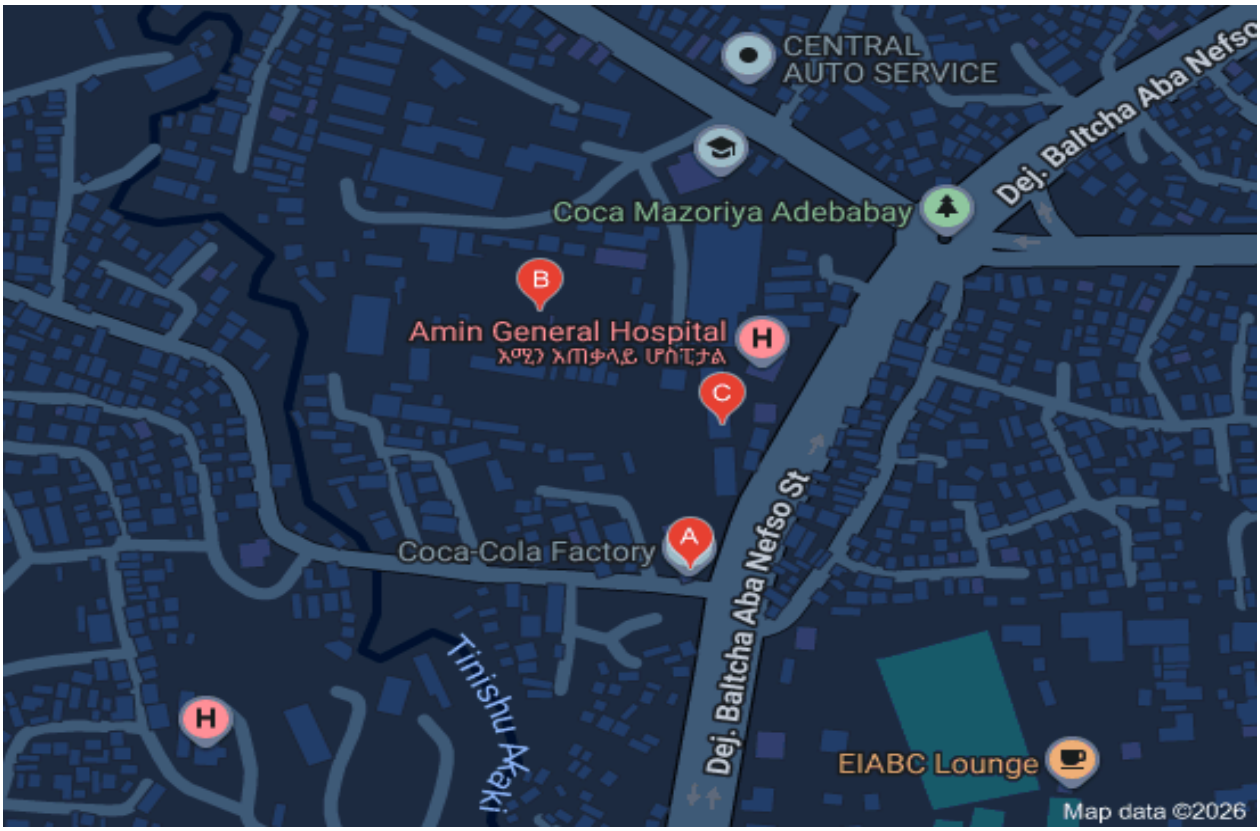


Figure 2 Description of the Study Area

Source: Google map 2026

3.2.1 Current Transport function

TAT Trend and Cost Analysis						
Month	2025 AA TAT	2024 AA TAT	2025 Volume	2024 Volume	2025 Rental Cost	2024 Rental Cost
January	36:26:22	23:46:41	1,806,070	2,439,579	26,733,861	15,160,559
February	43:04:58	13:42:03	2,250,511	2,929,252	41,441,847	23,914,120
March	54:30:12	13:36:37	2,189,623	3,278,003	48,577,364	30,518,770
April	69:22:28	20:14:23	1,735,504	2,335,222	31,678,794	24,693,321
May	58:59:49	22:33:38	1,906,009	2,488,377	46,354,385	32,565,020
June	66:50:21	18:26:53	2,235,640	2,798,751	54,562,320	28,230,312
July	67:38:33	26:06:13	1,623,415	1,269,318	36,576,426	5,471,896
August	75:15:11	39:53:01	1,455,713	1,634,440	32,040,467	9,376,240
September	68:27:45	34:24:35	1,787,650	1,777,617	29,066,284	11,089,189
October	104:37:01	38:30:00	1,554,107	1,433,106	35,164,070	9,276,961
November	165:41:34	51:44:53	1,489,293	1,256,394	35,268,552	5,984,626
SUM	810:54:14	302:58:56	20,033,535	23,640,059	417,464,371	196,281,014
Average	73:43:07	27:32:38	1,821,230	2,149,096	49,680,000	17,843,729

Table 1Current TAT Trend and Cost Analysis

According to your TAT (Turnaround Time) Trend and Cost Analysis, the statistics have shown a definite drop in efficiency in the current year (CY) as compared to the previous year (PY), along with the rise in costs connected with logistics.

On average, TAT grew enormously from 27:32:38 (PY) to 73:43:07 (CY), which indicates that the shipment is being completed in much longer time during the current year. The trend of growth persists through all months, especially during the last months (October and November) when the maximum values are registered (100+ hours and even up to 165 hours in November). That can be seen as the increase in inefficiency of logistics and transport operations over time.

As for the volume, it is slightly less in CY as compared to PY (on average 1.82M vs 2.15M units). That means that the performance has dropped, while the load is no larger; on the contrary, there were less goods, but their processing took longer time. Cost performance wise, the cost for CY is considerably high compared to PY (CY Total Cost: 417.46M vs PY: 196.28M), more than twice the overall cost incurred. This is because there are increasing operational costs despite a low volume for some months. Increasing TAT and the increasing cost show inefficiencies, potential delays, which lead to prolonged use of resources, and poor cost management in logistics operations.

The trend clearly shows a negative correlation between operational efficiency (TAT) and cost performance, such that increase in TAT means higher costs of logistics/rentals and less efficiency of services.

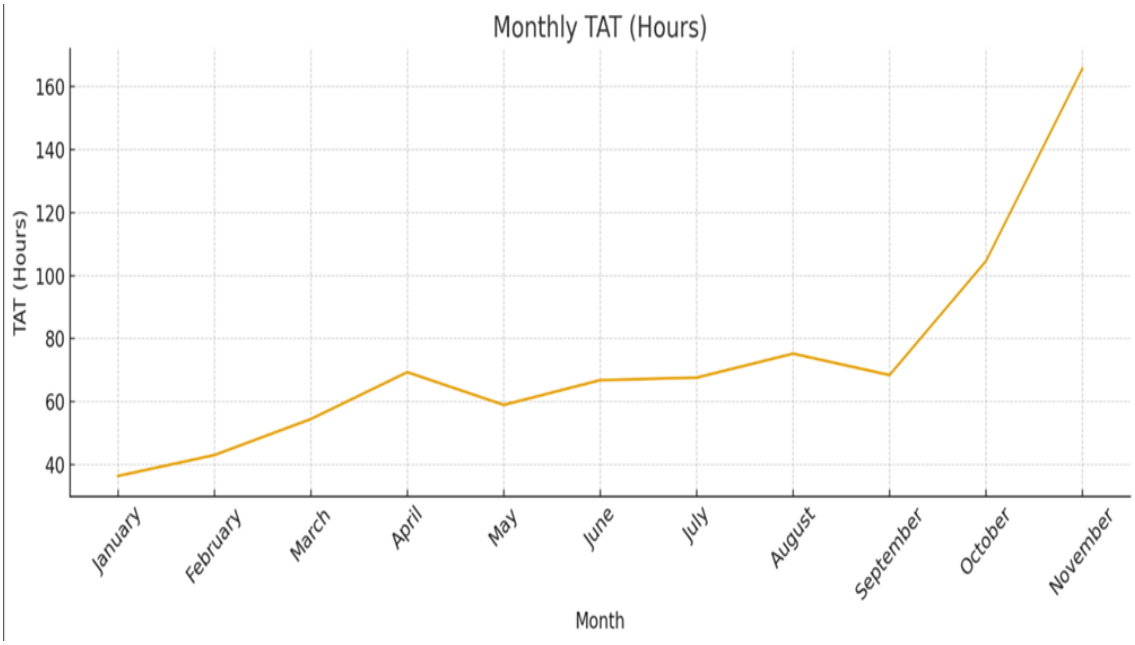


Figure 3 Trend of transport lead time at AA

3.3 Research Approach

In this chapter, the research methodology of the study is presented. This chapter covers the research design, population, sampling technique, and data collection technique that was adopted. In addition to the above mentioned factors, this chapter also explains the measurement of variables, data quality maintenance technique, and the testing of hypotheses using Structural Equation Modeling (SEM).

3.4 Research Design

The purpose of this study is to explore the determinants of supply chain performance with specific emphasis on Coca-Cola Beverages Africa (CCBA), Addis Ababa Plant. This research applied two types of research design approaches including descriptive research design and explanatory research design. Descriptive research design was applied to describe the present situation concerning the supply chain performance and the transportation process in the organization. On the other hand, the explanatory research design was applied to test the causality between the independent variables, Lead Time Efficiency, Transport Responsiveness, Information Sharing and Transport Coordination, and the dependent variable which is supply chain performance. In addition to this, both qualitative and quantitative data were collected to comprehensively analyze the research problem. Moreover, the quantitative data was tested by applying Partial Least Square (PLS) Structural Equation Modelling.

3.5 Population and Sampling Techniques

3.5.1 Target Population

The target population of this study comprised employees working in supply chain-related functional areas at Coca-Cola Beverages Africa (CCBA) Ethiopia, Addis Ababa Plant. As per the report by the Human Resource Department, there are a total of 1,293 people working for the organization, out of which 163 work in the supply chain management process. They perform tasks in different areas such as transportation, logistics, warehousing, and distribution. The sample was chosen because these employees work in the supply chain management process and thus have adequate knowledge and experience concerning the elements of supply chain performance.

3.5.2 Sample size determination

In the case of this study, a total population sampling method was used. All the 163 workers who are engaged in supply chain-related tasks at CCBA Ethiopia, Addis Ababa Plant (transportation, logistics, warehousing, and distribution divisions) were intended to be used as respondents in data gathering. The justification for the use of total population method in this case was due to the fact that the population was relatively small and accessible hence making it possible to incorporate all the units of analysis to have comprehensive data. Despite efforts being made to include the entire population, only 120 employees responded and provided complete questionnaires. This led to a response rate of about 73.6%. The rest of the questionnaires were not responded or were not complete and were therefore omitted from the analysis. Hence, the study will be based on the valid data collected from 120 respondents instead of the whole population. This methodology was deemed appropriate in this study since it reduces sampling errors through inclusion of the total population while the analysis is based on the actual responses received.

3.6 Data Collection Instruments

Both primary and secondary data sources were employed in collecting data that was relevant, accurate, and comprehensive for achieving the study's research aims. It is recommended in social science studies to use various sources in research because it increases the credibility and validity of the results through triangulation (Saunders, Lewis, & Thornhill, 2019). This also allows for a greater understanding of complex research questions, such as supply chain performance (Creswell & Creswell, 2018).

3.6.1 Primary Data Sources

The main source of data in the current study was obtained from respondents using the questionnaire, which was the major tool used in data collection process. As indicated by Kothari (2004), the structured questionnaires are commonly utilized in both descriptive and explanatory research designs due to their ability to collect standardized data among many respondents easily. The questionnaire was designed in accordance with the research objectives and based on already proven measurement scales utilized in other empirical research to enhance its content validity and reliability. Utilization of instruments that have already been tested and proved valid in quantitative research designs is recommended in particular in PLS-SEM research (Hair et al., 2017).

The potential respondents were employees who worked in the supply chain-related units in the company. Specifically, those respondents came from units dealing with transportations, warehousing, distribution, and logistics coordination processes. Employees in these departments were chosen since they are directly exposed to various processes influencing the performance of supply chain processes. As suggested in supply chain research, the operational employees provide valid information in relation to logistical activities in any organization (Chopra & Meindl, 2016).

The questionnaire had three main sections:

Characteristics of Respondents: The demographic characteristics include variables like age, gender, educational attainment, working experience, and departmental affiliation. Demographic information can be very crucial in identifying possible differences in responses among respondents (Sekaran & Bougie, 2016).

Independent Variables (Variables Affecting Supply Chain Performance): The independent variables were the measures of factors that influence supply chain performance. In particular, measures such as lead time efficiency, transport responsiveness, information sharing, and transport coordination were captured using items developed in previous studies.

Dependent Variable (Supply Chain Performance): The dependent variable was measured based on constructs such as delivery efficiency, responsiveness, effectiveness in coordination, and service quality. These constructs are common in measuring performance in supply chains in logistics studies (Gunasekaran, Patel, & McGaughey, 2004). The responses were measured using the five-point Likert Scale ranging from 5 ("Strongly Agree") to 1 ("Strongly Disagree"). This is one of the most popular methods of measuring attitudes and perceptions in social science research since it makes it possible to turn subjective statements into quantitative data and analyze it using statistical methods (Likert, 1932; Joshi et al., 2015). Apart from the closed questions, the survey included several open-ended questions as well. This helped gather more information that would not otherwise be possible to obtain through closed questions alone (Creswell & Creswell, 2018)

3.6.2 Secondary Data Sources

Secondary data was used in addition to the primary data to ensure that the results derived from the two types of data would be valid and reliable. The secondary data was sourced from credible sources such as organizational reports, company manuals, journal articles, textbooks, and prior studies. The use of secondary data is crucial for conducting research due to the fact that such data contributes to the formulation of theories, filling in the gaps within the methodology, and providing context to the empirical results (Saunders et al., 2019).

3.5.3 Pilot Testing of the Research Instrument

Pilot testing was done before the real data gathering in order to establish the effectiveness, consistency, and relevancy of the research tool used. As noted by Saunders, Lewis, and Thornhill (2019), pilot testing is an integral part of questionnaire-based research because it provides an opportunity to identify the possible issues relating to wording, structure, and comprehension of survey items before distributing the actual questionnaire. The major goal of the pilot testing was to ensure that the survey questions were comprehensible for respondents and measured the required constructs.

The pilot testing was conducted among a limited number of respondents who shared similarities with those in the actual research but were not part of the final sample to prevent any form of bias or lack of independence of the final data set. In this regard, some adjustments were made to the questionnaire based on the information gathered during the pilot testing. These changes included restructuring some questions, making sure that they were coherent, and enhancing wording.

Moreover, the pilot test served the purpose of checking the preliminary reliability of the measurement items. Reliability was evaluated through the use of Cronbach's Alpha, and if the results exceeded 0.70, then this could be considered satisfactory for internal consistency purposes (Nunnally, 1978; Hair et al., 2017). It can be concluded that the reliability level was sufficient for the measurement items to be utilized in further data collection activities.In general, the pilot testing procedure contributed positively to validity, comprehension, and reliability of the instrument used for the data collection in the current study.

3.7 Data Processing

According to Sekaran (2003), quoted in Kiage (2013), there are three aims of data analysis. These include understanding the data, assessing the goodness of data, and answering the research questions. Assessing the goodness of data makes it possible for the credibility of further analysis and results since it ensures reliability and validity of the measures used.

For this study, the process of data analysis was done according to the set research aims. Both descriptive and inferential statistics were applied. For instance, descriptive statistics such as frequency, percentage, mean, and standard deviation were applied to give description of the demographic information provided by the respondents as well as the study variables.

In addition, Partial Least Squares Structural Equation Modeling was used to test the relations between Lead Time Efficiency, Transport Responsiveness, Information Sharing, Transport Coordination, and Supply Chain Performance. This analysis was carried out with use of SmartPLS 4 tool. Reliability and validity tests were used to evaluate the measurement model. On

the other hand, Path coefficients, coefficient of determination, effect size, predictive relevance, and hypotheses testing were used to validate the structural model.

3.8 Methods of Data Analysis

In this research, Partial Least Square Structural Equation Modeling (PLS-SEM) was used in order to study the linkages between the studied variables and test the hypotheses proposed in the research. This technique was chosen due to its applicability in predictive analysis, flexibility in dealing with complex models, and suitability for small samples.

The analysis was conducted in two stages. First, the measurement model was evaluated through indicator reliability, internal consistency reliability, convergent validity, and discriminant validity. Second, the structural model was assessed using path coefficients, coefficient of determination (R^2), effect size (f^2), predictive relevance (Q^2), and bootstrapping procedures to determine the significance of the hypothesized relationships.

The structural model examines the effects of Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination on Supply Chain Performance.

3.9 Hypothesis

Based on empirical evidence from studies conducted by Martin Christopher (2016), Sunil Chopra and Peter Meindl (2019), A. Gunasekaran et al. (2001), Barbara B. Flynn et al. (2010), Suhong Li et al. (2006), Christopher R. Moberg et al. (2002), John T. Mentzer et al. (2001), and Donald J. Bowersox et al. (2013), the researcher developed the following alternative hypotheses to examine factors affecting supply chain performance in transportation function of Coca-Cola Beverages Africa Addis Ababa Plant.

H1: Lead Time Efficiency has a significant positive effect on Supply Chain Performance in the transportation function.

H2: Transport Responsiveness has a significant positive effect on Supply Chain Performance in the transportation function.

H3: Information Sharing has a significant positive effect on Supply Chain Performance in the transportation function.

H4: Transport Coordination has a significant positive effect on Supply Chain Performance in the transportation function.

3.10 Validity and Reliability of the Measurement Model

The measurement model was assessed using SmartPLS 4 prior to evaluating the structural relationships among the study variables. The purpose of the assessment was to ensure that the measurement items adequately represented their respective constructs and that the constructs were sufficiently distinct from one another. Based on the recommendations of Hair et al. (2022), the measurement model evaluation focused on indicator reliability, discriminant validity, and multi collinearity assessment. These procedures were conducted before testing the proposed hypotheses to ensure the quality and suitability of the measurement instruments.

3.10.1 Indicator Reliability

Indicator reliability was assessed using outer loadings. Outer loadings indicate the degree to which each observed indicator reflects its underlying construct. According to Hair et al. (2022), indicator loadings of 0.708 or higher are considered satisfactory. Indicators with loadings between 0.40 and 0.708 may be retained if they contribute meaningfully to the construct and do not adversely affect the overall quality of the measurement model.

3.10.2 Discriminant Validity

Discriminant validity refers to the extent to which a construct is empirically distinct from other constructs in the model. In this study, discriminant validity was assessed using the Fornell-Larcker Criterion and the Heterotrait-Monotrait Ratio (HTMT).The Fornell-Larcker Criterion requires that the square root of the variance extracted by a construct should exceed its correlations with other constructs. In addition, HTMT values below 0.90 indicate adequate discriminant validity and confirm that the constructs measure different concepts (Henseler et al., 2015).

3.10.3 Multicollinearity Assessment

Multicollinearity among the predictor constructs was assessed using the Variance Inflation Factor (VIF). According to Hair et al. (2022), VIF values below 5 indicate that multicollinearity is not a concern and that the predictor variables provide unique explanatory information within the model.The results of these assessments were used to determine the adequacy of the measurement model before proceeding to the evaluation of the structural model and hypothesis testing.

3.11. Ethical considerations

In Ethical standards were strictly observed throughout the research process to ensure the protection, rights, and well-being of the participants. Prior to data collection, permission was obtained from the relevant authorities of Coca-Cola Beverages Africa (CCBA), Addis Ababa Plant. Participation in the study was entirely voluntary. The purpose of the research was clearly explained to all respondents, and informed consent was obtained before administering the questionnaire. Participants were made aware that the data gathered would be used exclusively for academic purposes.

The respondents were told that participating in the survey was purely optional and that they could pull out at any point without facing any penalties. In order to ensure that the participants remained anonymous, no personally identifying information was collected. All responses were treated with strict confidentiality and used only for the purposes of this research. Furthermore, the study did not expose participants to any physical, psychological, or social risks. The questionnaire focused on issues related to transportation functions and supply chain performance within the organization and did not contain sensitive or harmful questions. Finally, the findings of the study were reported in aggregate form to ensure that individual respondents could not be identified.

CHAPTER FOUR
DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter deals with analyzing, interpreting, and discussing data obtained from this study. Specifically, this chapter will analyze the factors influencing the supply chain performance in the transportation function in the Addis Ababa Plant of CCBA. To begin with, this chapter will discuss response rate and respondent demographics in order to describe the sample used in this study. Thereafter, the measurement model will be analyzed using the SmartPLS 4 software. It should be noted that measurement model analysis is an important process because it helps to establish whether measurement items in a study are valid and reliable prior to performing structural model analysis.

After the measurement model analysis is completed, structural model analysis will follow. The structural model analysis will focus on testing and analyzing the relationship between Lead Time Efficiency, Transport Responsiveness, Information Sharing, Transport Coordination, and Supply Chain Performance. Structural model analysis will be performed using path coefficients, R^2 values, effect sizes, and predictive relevance. At last, the findings will be discussed vis-à-vis literature and the main findings will be summarized.

4.2 Response Rate Analysis

Coca-Cola Beverages Africa (CCBA) Ethiopia, Addis Ababa Plant, employees received a total of 163 questionnaires from the data in Table 2.As part of data collection, any questions returned were also checked for completeness and consistency. A total of 139 questionnaires were returned out of 163 ones that were distributed, which made the response rate 85.3%. However, 19 of the returned questionnaires were incomplete and, as a result, they were removed during the data editing stage.

Therefore, 120 questionnaires were properly filled in and well-kept for analysis, which constitutes 73.6% of all questionnaires that were sent out. Indeed, for studies based on survey, it has been shown that a response rate higher than 60% is generally considered enough for statistical analysis, while rates above 70% are seen as very good and sufficient for multivariate techniques such as Structural Equation Modeling (SEM) as per research standards. Therefore, the achieved response rate, i.e., 73.6, was considered satisfactory for proceeding with the analysis through SmartPLS 4. Besides, the last sample comprising 120 valid responses was definitely a strong

basis for doing both the measurement and the structural model assessment to thoroughly investigate the relationships among the study variables.

Table 2 Questionnaire Response Rate

Description	Correctly Filled and Returned	Not Correctly Filled	Not Returned	Total
Number	120	19	24	163
Percentage	73.6%	11.7%	14.7%	100%

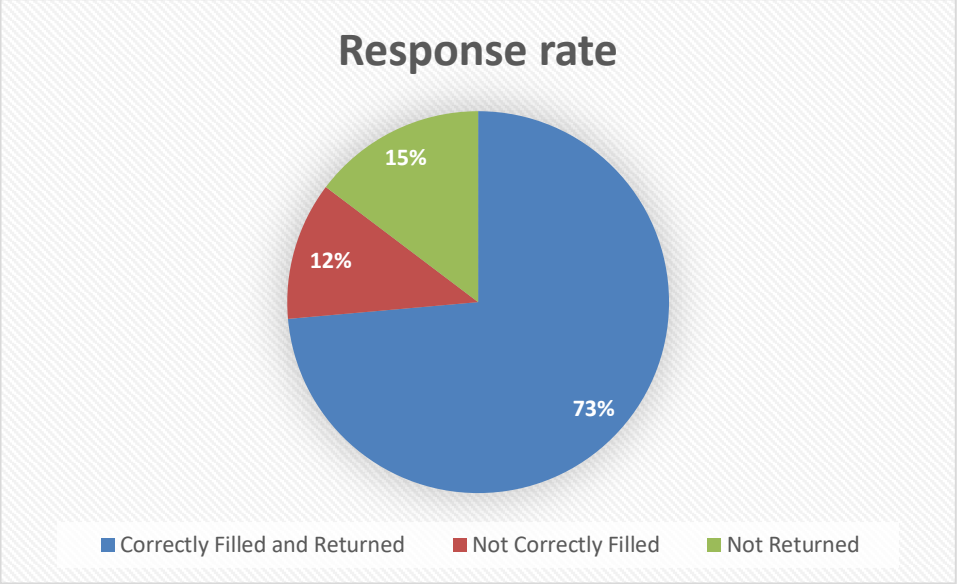


Figure 4 Questionnaire response rate

Source: Survey Data (2026)

4.3 Demographic Characteristics of the Respondents

This section is about examining the demographic characteristics of sample respondents. The initial part of the survey presents the respondent's demographic details (gender, age, educational level, experience, monthly income, and current position of respondents) pay the first attention towards them.

Table 3 Demographic characteristics of the respondents

	Variables	Frequency	Percent	Cumulative Percent
Gender	**Male**	76	63	63
	Female	44	37	100
	Total	**120**	**100**	
Age	**<=29year**	41	34	34
	30-44 year	56	47	81
	45-59year	18	15	96
	>=60year	5	4	100
	Total	**120**	**100**	
Marital status	**Single**	58	48	48
	Married	62	52	100
	Total	**120**	**100**	
Education	**<=12 grade**	10	8	8
	Diploma	15	13	21
	BA/BSC	55	46	67
	>=MA/MSc	40	33	100
	Total	**120**	**100**	
Experience	**<=2year**	21	18	18
	2-5year	30	25	43
	6-10year	31	26	69
	>10year	38	31	100
	Total	**120**	**100**	
Position	**Management**	25	21	21
	Non-Management	95	79	100
	Total	**120**	**100**	

Source: Field survey (2026)

4.3.1 Gender of respondents

Based on the above 63% (n=76) of the respondents were male, while 37% (n=44) were female. This indicates that the majority of the workforce surveyed within the transport and supply chain functions at the CCBA-Ethiopia, Addis Ababa Plant is male.

4.3.2 Age of respondents

According to the above table, 47% of the respondents belonged to the age group 30-44 years, 34% were aged 29 years or below, 15% were between 45 and 59 years, and 4% were seniors aged 60 years and above. It is clear that the largest segment of survey participants were the 30-

44 years age group. In fact, this implies that most of the people who took part in the research are within their most productive and economically active years, and this factor could positively influence their engagement in supply chain.

4.3.2 Marital Status of respondents

From the table, it can be seen that 52% of the respondents are married and 48% are single. Thus, most of the respondents are married in CCBA Ethiopia, Addis Ababa.

4.3.3 Educational Qualification of Respondents

Regarding the educational survey, 46% of the respondents have a first degree (BA/BSc), whereas 33% have a second degree (MA/MSc and above). The results point out that most respondents are first degree holders in CCBA-Ethiopia, Addis Ababa. This means that most of the employees in the organization are educated and professionally qualified.

4.3.4 Work Experience of Respondents

As can be seen from Table, 31% of respondents had more than 10 years of work experience, while 26% of them had between six and 10 years of work experience. Moreover, 25% of respondents had two to five years of work experience, while only 18% of respondents had less than two years of work experience. It is clear from the results that the highest number of respondents had more than 10 years of work experience.

4.3.4 Division/ Position of respondents

Finally, according to the above survey, 25 employees belong to the management team, which constitutes about 21 percent of all employees, while the other 95 employees or 79 percent belong to the non-management team.

4.4 Measurement Model Assessment

Before examining the association between the variables involved in the study, it became necessary to test the measurement model to see if all constructs are measured appropriately. Indicator reliability, internal consistency reliability, convergent validity, discriminant validity, and construct multi collinearity are the main issues that needed to be examined according to the PLS-SEM methodology. The measurement model test was conducted using SmartPLS 4.

4.4.1 Indicator Reliability (Outer Loadings)

Reliability of the indicator is represented as the extent to which the indicator measures the underlying construct. The outer loading minimum in a measurement model of the PLS-SEM

analysis should be taken at 0.708 because this means that the underlying construct accounts for 50% of the indicator's variance.

Table 4 *Outer Loadings of Measurement Items*

Construct	Item	Loading
Information Sharing	IS1	0.689
	IS2	0.756
	IS3	0.738
Lead Time Efficiency	LTE1	0.8
	LTE2	0.826
	LTE3	0.846
	LTE4	0.659
Supply Chain Performance	SP1	0.744
	SP2	0.764
	SP3	0.748
	SP4	0.709
	SP5	0.769
	SP6	0.563
Transport Coordination	TC1	0.768
	TC2	0.704
	TC3	0.694
	TC4	0.708
	TC5	0.789
Transport Responsiveness	TRSP1	0.729
	TRSP2	0.834
	TRSP3	0.681

Source: SmartPLS Output (2026)

Based on the results, it is clear that most of the indicators have a loading factor above the suggested level of 0.708. In other words, the indicators show reliable loadings. The indicators having satisfactory loadings include LTE1, LTE2, LTE3, SP1, SP2, SP3, SP4, SP5, TC1, TC4, TC5, TRSP1, and TRSP2. There were some indicators whose values were below the suggested level. These indicators include IS1 (0.689), LTE4 (0.659), SP6 (0.563), TC3 (0.694), and TRSP3 (0.681). Nevertheless, these indicators were used in the research because their loading was above the minimum accepted limit of 0.40.

4.4.2 Discriminant Validity Using Fornell-Larcker Criterion

The discriminant validity is about testing the uniqueness of the construct from other constructs within the model. Fornell and Larcker test is that the root mean square value of AVE should be greater than its correlations with other constructs.

Table 5 *Fornell-Larcker Criterion*

Fornell-Larcker Criterion for Discriminant Validity

	IS	LTE	SP	TC	TRSP
IS	0.728				
LTE	0.439	0.786			
SP	0.504	0.395	0.72		
TC	0.316	0.125	0.316	0.734	
TRSP	0.377	0.472	0.464	0.162	0.751

Source: SmartPLS Output (2026)

The figures underlined and in bold indicate the square roots of the AVE of each variable. These values are higher than the correlations between the variables and other constructs used in the study. In the case of Information Sharing, its square root of the AVE is 0.728, which is higher than the maximum correlation value of 0.504 of this variable with other constructs. Similarly, Lead Time Efficiency, Supply Chain Performance, Transport Coordination, and Transport Responsiveness meet the criterion of Fornell and Larcker. Thus, the findings prove that each construct measures a separate dimension.

4.4.3 Discriminant Validity Using HTMT Ratio

However, the Heterotrait-Monotrait Ratio (HTMT) test is a stricter approach for assessing discriminant validity. As stated by Henseler et al. (2015), HTMT values less than 0.90 indicate satisfactory discriminant validity. All HTMT values are less than 0.90, which is the required threshold. The highest HTMT value obtained is 0.701 between Information Sharing and Supply Chain Performance, which is significantly lower than the acceptable threshold. This provides a clear evidence that all the constructs are distinct and achieve discriminant validity.

Table 6 *HTMT Ratio*

HTMT Ratio

	IS	LTE	SP	TC	TRSP
IS					
LTE	0.619				
SP	0.701	0.487			
TC	0.47	0.171	0.391		
TRSP	0.54	0.624	0.581	0.255	

Source: SmartPLS Output (2026)

4.4.4 Collinearity Assessment (VIF)

Prior to exploring the relationships between the study variables in terms of structure, it is imperative to check whether there is any sign of multi collinearity among the predictor variables. The condition of multi collinearity arises when there exists a high degree of correlation between two or more independent variables, thus making it difficult to isolate the role of each individual independent variable on the dependent variable. In cases where multi collinearity is observed, there could be estimation problems associated with obtaining path coefficients.For the analysis of multi collinearity, the Variance Inflation Factor (VIF) test was applied. The VIF represents how much the variability of one predictor is increased by the presence of correlations among the predictor variables. As suggested by Hair et al. (2022), when the value of the VIF is less than 5, then there is no multi collinearity issue, whereas the value greater than 5 indicates possible collinearity issues that need further exploration.In the current research, the VIF test was applied to all independent variables including Information Sharing, Lead Time Efficiency, Transport Coordination, and Transport Responsiveness. The aim was to compare the values of the predictors with the critical value, in order to examine whether there is no redundancy in the explanation of Supply Chain Performance by the predictor variables. The lack of multi collinearity helps interpret the results from the structural model accurately.

Table 7 *Variance Inflation Factor (VIF)*

Construct	VIF
Information Sharing	1.406
Lead Time Efficiency	1.436
Transport Coordination	1.115
Transport Responsiveness	1.353

Source: SmartPLS Output (2026)

All the values of VIF are well below the cut-off point of 5. The maximum value of VIF is 1.436 corresponding to Lead Time Efficiency.It is evident from this figure that there exists no presence of multicollinearity between the predictors used here. Thus, all the independent variables have distinct contribution in predicting Supply Chain Performance.

4.5 Structural Model Assessment

Once the adequacy of the measurement model had been confirmed, the structural model was subjected to assessment to evaluate the nature of relationships that exist among the study constructs as well as the validity of the hypotheses developed in the course of this research. Assessment of the structural model is an essential process in PLS-SEM that helps determine the predictive ability of the model as well as its ability to predict the significance of the relationships existing between the dependent and independent variables.

According to Hair et al. (2022), some of the indicators that can be used in assessing the structural model include coefficient of determination (R^2), effect size (f^2), collinearity statistics (VIF), path coefficients, and results obtained from testing hypotheses through bootstrapping procedure. In the case of this study, the purpose of evaluating the structural model is to investigate the impact of lead time efficiency, transport responsiveness, information sharing, and transport coordination on supply chain performance in CCBA, Addis Ababa Plant.

4.5.1 Coefficient of Determination (R^2)

Table 8 *R-Square Results*

R-square

	R-square	R-square adjusted
SP	0.373	0.351

Source: SmartPLS Output (2026)

The coefficient R^2 with the value of 0.373 shows that Information Sharing, Lead Time Effectiveness, Transportation Coordination, and Transportation Responsiveness together account for 37.3% of the variance in Supply Chain Performance. While the adjusted R^2 of 0.351 implies that once the number of predictors has been adjusted, then the remaining percentage that

accounts for the variation of Supply Chain Performance is about 35.1%. The explanatory power of 35.1% can be viewed as moderate; hence, the model has some degree of relevance to the supply chain performance in CCBA Addis Ababa Plant.

4.5.2 Effect Size (f^2)

Table 9 *Effect Size Results*

Relationship	f^2 Value
IS → SP	0.102
LTE → SP	0.015
TC → SP	0.038
TRSP → SP	0.086

Information Sharing demonstrates the highest effect size of all predictor variables, whereas Transport Responsiveness has the second-highest effect size. Lead Time Efficiency possesses the least effect size. As per Cohen's criteria, all the effect sizes belong to the small effect range; however, Information Sharing and Transport Responsiveness have comparatively greater effects on Supply Chain Performance than other variables.

4.5.3 Path Coefficients and Bootstrapping Results

The structural model was tested through the bootstrap analysis technique by SmartPLS 4 in order to establish whether there were any significant relationships between the independent variables and Supply Chain Performance. This is done by considering the path coefficients (β), t-values, and p-values. A relationship is said to be statistically significant when its p-value is below 0.05 and its t-value is above 1.96.

Table 10 Path Coefficients and Bootstrapping Results

Path coefficients and Hypothesis Testing

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values
IS -> SP	0.299	0.309	0.088	3.396	0.001
LTE -> SP	0.116	0.127	0.096	1.204	0.229
TC -> SP	0.164	0.172	0.098	1.67	0.095
TRSP -> SP	0.27	0.266	0.085	3.17	0.002

Source: SmartPLS Output (2026)

The findings from the bootstrap analysis show that there is statistical significance between the two predictors Information Sharing and Transport Responsiveness and Supply Chain Performance. Information Sharing has a path coefficient of 0.299 at a p-value of 0.001. This shows that the improvement in the sharing of information improves the level of performance in the supply chain. Also, Transport Responsiveness has a path coefficient of 0.270 at a p-value of 0.002. This shows that the improvement in transport responsiveness also contributes to performance in the supply chain.

However, Lead Time Efficiency and Transport Coordination have no statistical significance. The p-value for Lead Time Efficiency was 0.229 and for Transport Coordination the p-value was 0.095, which means that none of these two variables had any statistical significance towards influencing Supply Chain Performance in this study.It is evident that among all variables, Information Sharing has the most influence on the dependent variable, while second is Transport Responsiveness.

4.6 Hypothesis Testing

Four hypotheses were developed in the study to test the effects of Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination on supply chain performance. These hypotheses were tested using the bootstrapping results derived from the SmartPLS 4 software package.

Table 11 Summary of Hypothesis Testing Results

Hypothesis	Statement	P-Value	Decision
H1	Lead Time Efficiency has a significant positive effect on Supply Chain Performance	0.229	Not Supported
H2	Transport Responsiveness has a significant positive effect on Supply Chain Performance	0.002	Supported
H3	Information Sharing has a significant positive effect on Supply Chain Performance	0.001	Supported
H4	Transport Coordination has a significant positive effect on Supply Chain Performance	0.095	Not Supported

Source: SmartPLS Output (2026)

From the hypothesis testing, the outcome suggests that out of the four hypotheses tested, two of them were accepted. That is, Information Sharing and Transport Responsiveness were found to have a significant effect on Supply Chain Performance. On the other hand, Lead Time Efficiency and Transport Coordination hypotheses were rejected due to the fact that their p-value was above the threshold of 0.05. This indicates that though they could have an impact on the dependent variable, their impact was insignificant in the case of Coca-Cola Beverages AA Plant

4.7 Discussion of Findings

The implications of the results of the study are presented in this part. This presentation focus mainly on the impact of Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination on supply chain performance. These implications are further analyzed and compared with previous studies on the same topic.

4.7.1 Lead Time Efficiency and Supply Chain Performance

The first research hypothesis suggested that there is a positive relationship between Lead Time Efficiency and Supply Chain Performance. But the finding shows that there is no significant relationship between Lead Time Efficiency and Supply Chain Performance ($\beta = 0.116$, $p = 0.229$). Because the p-value is higher than the 5% significance level, H1 is rejected. It means that there is no statistically significant relationship between Lead Time Efficiency and Supply Chain Performance at CCBA Addis Ababa Plant. An implication from this finding is that, even though Lead Time Efficiency is viewed as one of the critical factors in supply chain performance, it is not enough on its own to account for the differences in Supply Chain Performance observed in this study. This can be attributed to the fact that there might be standardization of lead time procedures within the organization, hence reducing the difference between the responses. Alternatively, it could be due to the consistency in responses on lead time efficiency making it less significant statistically. Another reason for this is that Lead Time Efficiency has a smaller impact on performance than the other factors in the model.

4.7.2 Transport Responsiveness and Supply Chain Performance

The second research hypothesis (H2) suggests that Transport Responsiveness has a positive and statistically significant effect on Supply Chain Performance. According to the findings from the structural equation modeling, Transport Responsiveness has a positive and statistically significant effect on Supply Chain Performance ($\beta = 0.270$, $t = 3.170$, $p = 0.002$). Given that the p-value is less than 0.05, H2 is proven.

This means that the Transport Responsiveness is a key variable in affecting Supply Chain Performance at CCBA Addis Ababa Plant. It can be seen from the results that efficient transport operations have a direct impact on Supply Chain Performance, since it enables the organization to deliver their customers' requirements in time and to achieve coordination in supply chain activities. The statistically significant relationship between these two variables indicates that the Transport Responsiveness is an important factor in accounting for variations in Supply Chain Performance.

4.7.3 Information Sharing and Supply Chain Performance

Thirdly, there was a hypothesis that Information Sharing has a positive and significant effect on Supply Chain Performance. This hypothesis is greatly confirmed from our analysis ($\beta = 0.299$, $p = 0.001$).Of all the independent variables, Information Sharing has the highest path coefficient, implying that it is the most important variable in explaining the variability in Supply Chain Performance.

The conclusion that can be drawn from this finding is that proper and adequate communication as well as the exchange of information among the different departments of CCBA Addis Ababa Plant play an important role in improving efficiency in their operations. Information sharing enhances planning, coordination, and decision-making as well as problem solving in supply chain operations. Information sharing will help in the efficient running of CCBA Addis Ababa Plant since those employees who are in possession of the required information are able to coordinate activities in a manner that enables them to meet their targets.This finding is consistent with other supply chain studies carried out in the past.

4.7.4 Transport Coordination and Supply Chain Performance

According to the findings, it has been found that Transport Coordination has no significant effect on Supply Chain Performance ($\beta = 0.164$, $p = 0.095$). In this way, the hypothesis (H5) has not been validated since it is not statistically significant at the 5% significance level. Thus, there is no evidence to prove the relationship between transport coordination and supply chain performance as per the results of this study.

In this way, it can be said that transport coordination has no statistically significant effect on supply chain performance according to this study. The possible reasons for this result may be the standardization of the coordination process in the transportation activity of the organization; thus, there would not be any difference due to lack of variations. There might be an indirect effect of the transport coordination on supply chain performance through some other mediating variable.

In general, this chapter has been dedicated to discussing the results of data collected from Coca-Cola Beverages Africa Addis Ababa Plant workers. Measurement model analysis suggested that constructs had high validity and reliability indicators. According to structural model analysis, independent variables accounted for 37.3% of the variance in Supply Chain Performance.

As for hypothesis testing, the results showed that Information Sharing and Transport Responsiveness were significant predictors of Supply Chain Performance, while Lead Time Efficiency and Transport Coordination had no statistically significant influence. Information Sharing appeared to be the most influential construct among independent variables.

4.7 Structural model

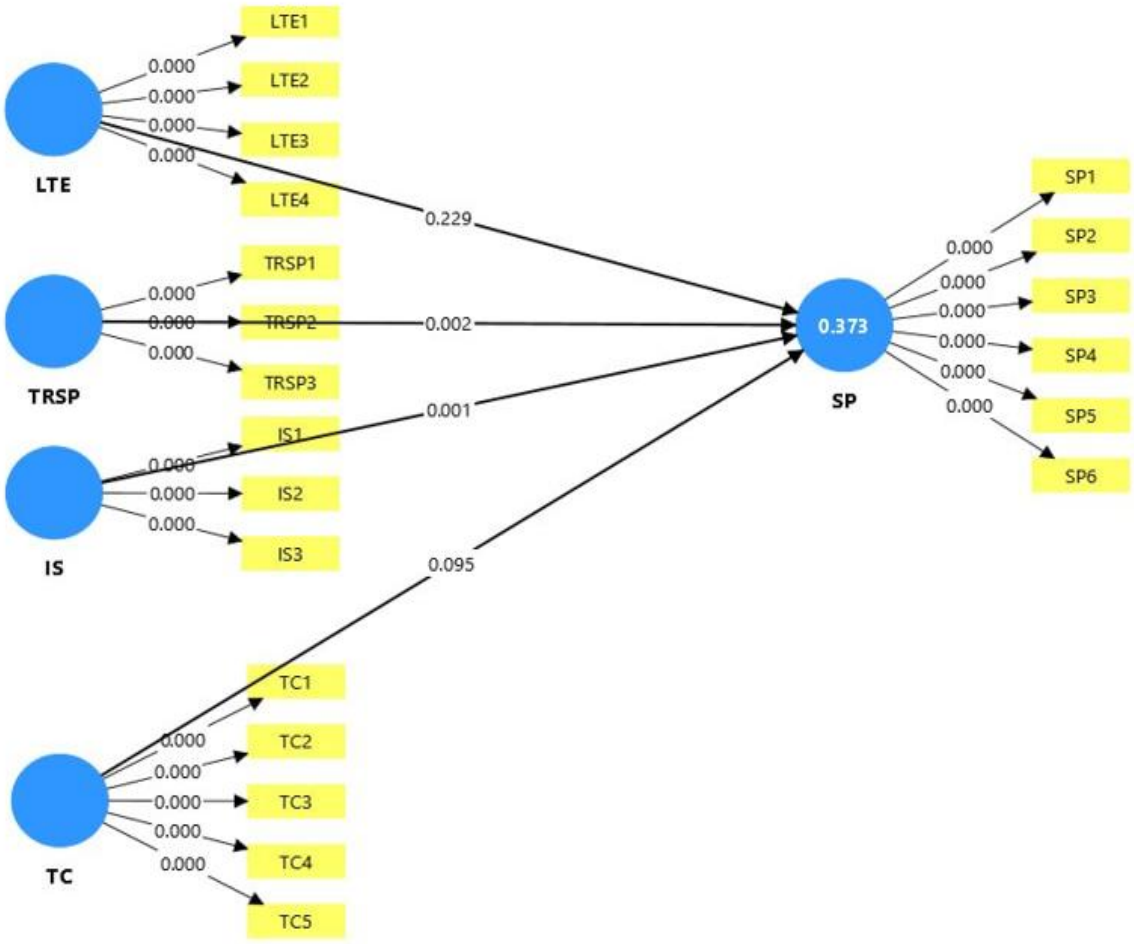


Figure 5 Structural Model Results

In your case, the structural model reveals how the independent variables explain the Supply Chain Performance using an adequate amount of explanatory power ($R^2 = 0.373$) and relevant predictive power ($Q^2 > 0$). The model also reveals that only Transport Responsiveness and Information Sharing influence the Supply Chain Performance, whereas Lead Time Efficiency and Transport Coordination do not. In essence, the structural model reveals the important factors influencing the Supply Chain Performance.

Category	Analysis Focus	Results & Interpretation
Measurement Model	Indicator reliability	Loadings mostly > 0.708 → indicators acceptable
	Validity (AVE, HTMT)	AVE > 0.50; HTMT < 0.90 → valid & distinct
	Multicollinearity (VIF)	No multicollinearity (VIF < 5)
Structural Model	R^2	0.373 (Adj. 0.351) → moderate explanatory power
	Effect size (f^2)	Information Sharing (Strongest effect)
	Q^2	Predictive Relevane ($Q^2 > 0$)
	Path results	IS & TRSP significant ($p<0.05$)
Hypotheses & Key Findings	Overall result	IS & TRSP accepted; LTE & TC rejected. Performance driven by IS and TRSP.

Table 12 Results of Measurement Model and Structural Model

Source: SmartPLS Output (2026)

The outcomes of the measure model demonstrate that all constructs are consistent with the required psychometric criteria. Indicators' reliability is proven because the vast majority of factor loadings is higher than 0.708. Convergent validity is proven because all AVE scores are above 0.50, and discriminant validity is proven through HTMT values lower than the 0.90 criterion. In addition, there are no problems with multi collinearity in the model because all VIF scores are lower than 5.

The results of the structural model reveal that the model is characterized by moderate explanatory power, namely, the R^2 and adjusted R^2 score is 0.373 and 0.351 correspondingly for Supply Chain Performance. Furthermore, the model has predictive relevance because all Q^2 scores are higher than zero. Among all predictors, Information Sharing is characterized by the highest effect size.

The hypothesis testing results demonstrate that Information Sharing and Transport Responsiveness are statistically significant determinants of Supply Chain Performance while Lead Time Efficiency and Transport Coordination do not have significant effects on the dependent variable at the 5% level of significance. In general, it can be stated that there are two supported hypotheses in the model.

4.8 TAT Trend and Cost Analysis (CY vs PY)

This segment provides an analysis of Turnaround Time (TAT), operational volume and cost performance for both Current Year (CY) and Previous Year (PY). The aim of this analysis is to look at operational efficiency trends over time concerning transportation performance. From the results, Turnaround Time (TAT) showed a considerable increase during the current year as compared to the previous year. The average TAT in the current year is 73:43:07 while the average in the previous year is 27:32:38, which implies that there is a significant decrease in operational efficiency. The CY TAT is generally higher as compared to the PY TAT, particularly in the later months like October and November where TAT was 104:37:01 and 165:41:34.

Concerning operational volume, the total in the current year is 20,033,535 as compared to the total in the previous year, which was 23,640,059. The reduction in operational volume does not seem to have influenced the increase in TAT because TAT still increased. In terms of cost performance, the rent of CY has risen considerably from 196,281,014 in PY to 417,464,371. This means that the operational cost for transportation and rentals has almost doubled in the present year although the operational volumes are the same or even lesser than the previous year.On the whole, the study reveals that while there is an increase in TAT and operational cost in the current year compared to last year, there is a reduction in volume.

4.9 Summary of Open-Ended Questions

The open-ended questions were used to obtain respondents' perspectives on the relationship between the independent variables and Supply Chain Performance at CCBA Addis Ababa Plant. On the issue of Lead Time Efficiency, many respondents noted that even though this variable is relevant, its influence is minimal on Supply Chain Performance since the lead time process is standardized within the organization.On Transport Responsiveness, it was revealed that this is a very influential factor which plays an important role in enhancing Supply Chain Performance. This is because quick response to any operational issues makes the process more efficient and reliable. In addition, many respondents agreed that Information Sharing is very influential for Supply Chain Performance. Conversely, Transport Coordination was revealed as being not influential for Supply Chain Performance. While it is acknowledged that coordination is relatively well established, there are suggestions that coordination of different logistics activities can be better to increase efficiency. Overall, from the results of the qualitative study, it is evident that Transport Responsiveness and Information Sharing have more influences on Supply Chain Performance compared to Lead Time Efficiency and Transport Coordination.

CHAPTER FIVE

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The main objective of this chapter is to present the summary of the study, make conclusions from the results presented in Chapter Four, give recommendations, and identify the contributions and Research Limitations and Suggestions for Future Research.

5.1 Introduction

This chapter presents the findings of this study mainly including the summary of the study findings, conclusions drawn from the study, recommendations, limitations of the study, and suggestions for future research. This study was conducted to find out factors influencing supply chain performance in transportation within Coca-Cola Beverages Africa (CCBA), Addis Ababa Plant. More specifically, the impact of Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination on Supply Chain Performance has been examined using PLS Structural Equation Modeling (PLS-SEM).

5.2 Summary of Major Findings

The main purpose of this research was to investigate the determinants of Supply Chain Performance in the transportation department of CCBA, Addis Ababa plant. Census research technique was used, where all the 163 staff involved in supply chain related activities in the company were considered as respondents for this research. In total, there were 120 responses which were valid for the analysis, using SmartPLS 4 software. Hereunder are the major results of this study.

5.2.1 Information Sharing

The result shows that Information Sharing has a positive effect on Supply Chain Performance ($\beta = 0.299$, $p = 0.001$).This implies that the Information sharing within the supply chain participants and the exchange of information have a considerable influence on improving performance. Accordingly, when the individuals working in an organization are provided with the right information, they will be able to coordinate their operations and solve the problems arising. Of all variables used in the study, Information Sharing was found to be the best predictor of Supply Chain Performance.

5.2.2 Transport Responsiveness

The results show that Transport Responsiveness has a positive effect on Supply Chain Performance ($\beta = 0.270$, $p = 0.002$).It implies that responding quickly to issues related to transport, deliveries, customer needs, etc., can help in improving supply chain performance. Such organizations would find themselves well prepared for meeting the customers' needs.

5.2.3 Lead Time Efficiency

Lead Time Efficiency is the ability of the supply chain system to reduce the amount of time between placing the order and completing the delivery. In this study, Lead Time Efficiency was assumed to positively affect Supply Chain Performance. But according to the result obtained from the structural model analysis, Lead Time Efficiency positively affects Supply Chain Performance, but its effect is statistically insignificant ($\beta = 0.116$, $p = 0.229$). That means Lead Time Efficiency does not have a significant effect on Supply Chain Performance in the case of CCBA Addis Ababa Plant. It implies that lead time efficiency variation cannot affect the performance of the supply chain system in the study area. That means there are some factors which can affect the performance of the supply chain system more than lead time efficiency.

5.2.4 Transport Coordination

Transportation Coordination was found to be non-statistically significant as far as its impact on Supply Chain Performance ($\beta = 0.164$, $p = 0.095$). Although there is a positive correlation between Transportation Coordination and Supply Chain Performance, the results are not statistically significant. Thus, Transportation Coordination does not affect Supply Chain Performance directly at CCBA Addis Ababa Plant.

5.2.5 Explanatory Power of the Model

The explanatory power of the model can be measured through the coefficient of determination (R^2), which shows the percentage of variance in Supply Chain Performance accounted for by the independent variables. For this particular model, the R^2 statistic equals 0.373 (adjusted R^2 equals 0.351), meaning that 37.3% of variance in Supply Chain Performance is accounted for by Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination. The level of explanatory power can be viewed as moderate in the social sciences; this means that while the model accounts for the substantial share of the variability of the dependent variable, there are other variables affecting Supply Chain Performance as well.

5.3 Conclusion, Limitations, and Recommendations

5.3.1 Conclusions

The primary purpose of this research is to explore the determinant of Supply Chain Performance related to the transportation aspect of Coca-Cola Beverages Africa (CCBA), Addis Ababa Plant. In particular, the current research evaluates the impact of Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination on Supply Chain Performance through the Partial Least Squares Structural Equation Modeling (PLS-SEM) method.

There are numerous implications which arise from this empirical analysis. Primarily, Information Sharing is significantly associated with Supply Chain Performance. The relationship between them is positive, and the former is the strongest predictor of the latter. It means that the efficient sharing of accurate and relevant information by supply chain partners contributes to better decision making and coordination of operations. Consequently, companies which develop their information systems can expect better results in the field of supply chain performance.

Secondly, the Transport Responsiveness variable was also discovered to positively influence the Supply Chain Performance variable. This indicates that the responsiveness of the transportation system in meeting the changing needs of the customers plays an important role in improving the performance of the company's supply chain operations. This implies that faster and adaptive transport operations can improve efficiency and performance.

Thirdly, while Lead Time Efficiency was positively related to Supply Chain Performance, this variable was statistically insignificant. This means that Lead Time Efficiency does not help in explaining variations in Supply Chain Performance at CCBA Addis Ababa Plant. One possible reason for this result could be that the lead time process could already be standardized in all departments, thus, making little variation in influencing supply chain performance.

Similarly, the role of Transport Coordination was found to be significant in a positive manner for Supply Chain Performance but without statistical significance. This means that even though the coordination of transport processes is necessary for efficient functioning, this variable does not significantly impact supply chain performance in this particular study setting. The reason might be that these processes of coordination are well established and consistently used in the company.

Furthermore, the analysis of the structural model revealed that the four predictor variables account for 37.3% of variance in the dependent variable of Supply Chain Performance (R^2 = 0.373). This shows moderate prediction ability of the model, which means that the variables included in the model are important for understanding supply chain performance but not all of them, and some others exist as well.

On balance, it can be concluded that the two most critical factors of Supply Chain Performance at CCBA Addis Ababa Plant are Information Sharing and Transport Responsiveness. These two factors are instrumental for increasing efficiency and effectiveness of operations. Nevertheless, Lead Time Efficiency and Transport Coordination do not have any statistically significant influence on Supply Chain Performance. Therefore, all improvements should be aimed at development of information sharing system and transport responsiveness.

5.3.2 Recommendations

Based on the findings of the study, the following recommendations are made to Coca-Cola Beverages Africa (CCBA), Addis Ababa Plant to improve Supply Chain Performance.

The organization should strengthen real-time information sharing and coordination across all supply chain functions. This can be achieved through improved digital communication systems, integrated data platforms, and ensuring timely and accurate information flow between internal departments and external partners such as suppliers and transport providers. This will enhance decision-making and operational efficiency.

CCBA should also improve route planning and transport management systems by adopting advanced logistics tools such as route optimization systems, transport tracking technologies, and automated scheduling systems. These improvements will help reduce delays, improve delivery reliability, and enhance overall transport responsiveness. In addition, the organization should invest in continuous employee training and development programs, particularly in areas such as decision-making, problem-solving, flexibility, and operational coordination. Well-trained employees are better equipped to respond effectively to supply chain disruptions and operational challenges.Furthermore, CCBA should strengthen cross-functional integration among logistics-related departments, including transport, warehousing, and distribution units. Improved integration will reduce operational gaps, improve coordination, and support smoother flow of goods and information.

The organization should also implement a system for continuous monitoring and evaluation of key performance indicators (KPIs) such as transport performance, delivery reliability, and lead time efficiency. This will support ongoing performance improvement and early identification of inefficiencies. Finally, since the current model explains only 37.3% of Supply Chain Performance, CCBA should consider broader strategic factors in future improvement initiatives, such as technology adoption, supplier relationship management, infrastructure development, and organizational structure. These additional factors may further enhance supply chain performance beyond operational transportation functions.

5.5 Contribution of the Study

This study helps the field of supply chain management in two ways. It helps us understand things better. It also helps us do things better. From the understanding side this study looks at what affects supply chain performance in the transportation part of a manufacturing company in Ethiopia. Most studies like this have been done in places with economies and in different types of industries but we do not know much about how transportation affects supply chain performance in the Ethiopian beverage manufacturing sector. So this study helps fill that gap by looking at what happens at Coca-Cola Beverages Africa in Addis Ababa.

This study also adds to what we know about supply chain performance by showing that sharing information and being responsive when moving things are important for supply chain performance. At the time we found out that how long things take to get from one place to another and how well we coordinate transportation do not make a big difference in this case. Such findings enable us to understand that various factors may have varying impacts on the performance of supply chains in different companies based on their operations.From a practical perspective, this research provides important insights for people involved in managing transport and operations within the supply chain. In particular, it is necessary to exchange information and react flexibly to changes to achieve improved performance of the supply chain.

The suggestions in this study can help managers make plans to improve how things work the quality of service and overall supply chain performance. This study also shows that a method called Partial Least Squares Structural Equation Modeling can be used to study supply chain management issues in countries that are still developing. Other researchers can use this study as an example of how to use this method to look at problems. Overall this study gives us facts, practical ideas for managers and guidance, on how to do research that can help us improve supply chain performance. The study of supply chain management and supply chain performance is very important. This study helps us learn more about supply chain performance and supply chain management.

5.6 Limitations of the Study

Like any academic research, this study has certain limitations that should be considered when interpreting its findings. First, the study was conducted exclusively at Coca-Cola Beverages Africa (CCBA), Addis Ababa Plant. As such, the results cannot be generalized completely to other manufacturing firms in Ethiopia or other industries because the processes and structure of operations, organizational culture, and supply chain network can differ.

Secondly, this research paper has considered only four explanatory variables, specifically Lead Time Efficiency, Transport Responsiveness, Information Sharing, and Transport Coordination. These four independent variables are very relevant to the research topic being discussed in this research paper. However, some other factors such as technological advancements, supplier management capabilities, quality of infrastructure facilities, and competencies of employees have not been included in the model. As such, the power of explanation in this research paper is limited to the independent variables.

Finally, questionnaire survey method was used for conducting this study, where information was gathered by giving questionnaires to various employees working in the organization. It is one of the most popular methods of gathering information in any kind of social science research but it is subject to respondent bias which can affect their answers. Furthermore, the study adopted cross-sectional research methodology.

Consequently, the research design does not account for any change in supply chain management over time, and hence any causal inference needs to be made carefully. Nevertheless, the research findings offer valuable insight into the variables that influence the SC Performance. The results will be instrumental in defining the parameters of the study.

5.7 Suggestions for Future Research

Future researchers can advance the research of this study by including other variables that can affect the Supply Chain Performance. The technological advancement, supplier relationship management, infrastructural condition, inventory management, and staff competence are some variables that can be incorporated in order to understand fully the nature of supply chain and its performance.

Moreover, future studies can conduct comparative research among several manufacturing companies. The comparative research is important since the result of the study is generalized from one company. Through comparative research, the researcher can obtain more information about the subject matter by analyzing different companies. Moreover, future researchers can use the longitudinal research design in their study. Longitudinal study enables the researcher to look at how transportation-related variables affect the Supply Chain Performance in the long run.

Furthermore, future researchers can look for factors that can affect the relationships among Lead Time Efficiency, Transport Coordination, and Supply Chain Performance. Understanding the influence of each variable on the other variables is necessary for future studies since it helps identify the circumstances where the variables can influence more significantly.

REFERENCES

- Azadeh, A., Atrchin, N., Salehi, V., & Shojaei, H. (2014). Modelling and improvement of supply chain with imprecise transportation delays and resilience factors. *International Journal of Logistics Research and Applications, 17*(4), 269–282.
- Ballou, R. H. (2007). *Business logistics/supply chain management: Planning, organizing, and controlling the supply chain*. Pearson Prentice Hall.
- Bowersox, D. J., Closs, D. J., & Cooper, M. B. (2013). *Supply chain logistics management*. McGraw-Hill Education.
- Chan, F. T. S., & Zhang, T. (2011). The impact of collaborative transportation management on supply chain performance: A simulation approach. *Expert Systems with Applications, 38*(3), 2313–2329.
- Christopher, M. (2016). *Logistics & supply chain management*. Pearson Education.
- Coyle, J. J., Langley, C. J., Novack, R. A., & Gibson, B. (2013). *Supply chain management: A logistics perspective*. Cengage Learning.
- Diriba, A., & Ram, B. (2023). Information sharing, logistics practices and supply chain performance of firms in Ethiopia. *International Journal of Business Performance and Supply Chain Modelling*.
- Drljača, M., & Sesar, V. (2023). Supply chain transportation management. *Transportation Research Procedia, 74*, 338–345. https://doi.org/10.1016/j.trpro.2023.11.153
- Flynn, B. B., Huo, B., & Zhao, X. (2010). The impact of supply chain integration on performance: A contingency and configuration approach. *Journal of Operations Management, 28*(1), 58–71.
- Gebisa. (2023). Information sharing, inventory management practices and firm performance in Ethiopia. *Gadjah Mada International Journal of Business*.
- George, J., & Pillai, V. M. (2019). A study of factors affecting supply chain performance. *Journal of Physics: Conference Series, 1355*(1), 012018.
- Gunasekaran, A., Patel, C., & Tirtiroglu, E. (2001). Performance measures and metrics in a supply chain environment. *International Journal of Operations & Production Management, 21*(1/2), 71–87.
- Hummels, D. (2001). Time as a trade barrier. *Journal of International Economics, 54*(1), 75–96.
- Koh, S. C. L., Saad, S. M., & Arunachalam, S. (2004). Measuring and evaluating supply chain performance: An exploratory study of manufacturing firms. *International Journal of Production Economics, 87*(3), 333–351.
- Krumwiede, D. W., & Sheu, C. (2000). A model for reverse logistics entry by third-party providers. *International Journal of Physical Distribution & Logistics Management, 30*(3/4), 325–333.
- Lai, K. H., Ngai, E. W. T., & Cheng, T. C. E. (2002). Measures for evaluating supply chain performance in transport logistics. *Transportation Research Part E: Logistics and Transportation Review, 38*(6), 439–456.
- Lai, K. H., Ngai, E. W. T., & Cheng, T. C. E. (2004). An empirical study of supply chain performance in transport logistics. *International Journal of Production Economics, 87*(3), 321–331.
- Langley, C. J., & Holcomb, M. C. (1992). Creating logistics customer value. *Journal of Business Logistics*.
- Lee, H. L., Padmanabhan, V., & Whang, S. (1997). The bullwhip effect in supply chains. *Sloan Management Review, 38*(3), 93–96.

- Li, S., Ragu-Nathan, B., Ragu-Nathan, T. S., & Rao, S. S. (2006). The impact of supply chain management practices on competitive advantage and organizational performance. *Omega*, *34*(2), 107–124.
- Lynch, D. F., Keller, S. B., & Ozment, J. (2000). Supply chain innovation. *Journal of Business Logistics*.
- Mentzer, J. T., DeWitt, W., Keebler, J. S., Min, S., Nix, N. W., Smith, C. D., & Zacharia, Z. G. (2001). Defining supply chain management. *Journal of Business Logistics, 22*(2), 1–25.
- Moberg, C. R., Cutler, B. D., Gross, A., & Speh, T. W. (2002). Identifying antecedents of information exchange within supply chains. *International Journal of Physical Distribution & Logistics Management, 32*(9), 755–770.
- Morash, E. A., & Clinton, S. R. (1997). The role of transportation capabilities in international supply chain management. *Transportation Journal, 36*(3), 5–17.
- Mulugeta, A. (2021). *Green supply chain management practices and challenges: The case of Coca-Cola Beverages Africa Addis Ababa Plant* (Master's thesis, Addis Ababa University School of Commerce).
- Poirier, C. C. (2009). *Advanced supply chain management: How to build a sustained competitive advantage*. Berrett-Koehler Publishers.
- Sakka, O., & Botta-Genoulaz, V. (2009). A model of factors influencing the supply chain performance. In *2009 International Conference on Computers & Industrial Engineering* (pp. 1101–1106).
- Silver, E. A., Pyke, D. F., & Peterson, R. (1998). *Inventory management and production planning*. Wiley.
- Stefansson, G., & Lumsden, K. (2008). Performance issues of smart transportation management systems. *International Journal of Productivity and Performance Management, 58*(1), 76–91.
- Sreenivas, M., & Srinivas, T. (2001). The role of transportation in logistics chain. Alluri Institute of Management Science.
- Tibben-Lembke, R. S. (2002). Life after death: Reverse logistics and the product life cycle. *International Journal of Physical Distribution & Logistics Management, 32*(3), 223–244. https://doi.org/10.1108/09600030210426548
- Wilson, M. C. (2007). The impact of transportation disruptions on supply chain performance. *Transportation Research Part E: Logistics and Transportation Review, 43*(4), 295–320.
- Zaidatol, A. L. P., Bagheri, A., & Harrison, C. (2012). Analysis of Likert-scale data in social sciences and business research. *Journal of Business and Social Sciences, 4*(2), 112–125.

APPENDIX A

Research Questionnaires
Addis Ababa University
College Of Business and Economics
Master of Business Administration (Distance Program)

Dear Respondents

You are invited to participate in a research project entitled "Factors Affecting supply chain Performance Emphasis on Transport Function, in A Case study of coca cola beverages Africa Addis Ababa plant. Your effort is very essential part of this research. Thus, I kindly request you to spend some time to fill-up the questionnaire based on the instruction under each section. The primary purpose of this study is for the fulfilment of master's degree in Business Administration. The information you provide will not to be disclosed and used only for the purpose of the study. The questioner had been coded and you don't need to write your name.

I would like to thank you in advance for your cooperation. For any question and suggestion, here below is my addresses: Email: rahelfuje285@gmail.com, Mob. +251967790644

Section I- Demographic information

Direction: Please answer the following questions by ticking (√) on your choice from the response options:

1. Gender: Male ☐ Female ☐

2. Age: 18-29 ☐ 30-44 ☐ 45-59 ☐ Above 60 ☐

3. Marital status: Single ☐ Married ☐ Divorced ☐ Widowed ☐

4. Educational level: Below Diploma ☐ Diploma ☐ First Degree ☐ Master's Degree ☐ Above Master's Degree ☐

5. Work Experience: Below 2 years ☐ 2-5 years ☐ 6-10 years ☐ Above 10 years ☐

6. Division of Employment: Distribution Manager ☐ Warehouse Manager ☐

Logistics Manager ☐ Warehouse team leader ☐ Distribution Coordinator

☐ Distribution Analyst ☐

Section II: Questions related with Transport Function

Please rate to what extent do you agree or disagree with the following statements about organization culture in your organization, ranging from strongly disagree to strongly agree and by ticking (√) that describes your view better.

1 = Strongly Disagree2 = Disagree 3 = Neutral 4 = Agree 5 = Strongly Agree

Factors	**Strongly Disagree**	**Disagree**	**Natural**	**Agree**	**Strongly Agree**
	1	**2**	**3**	**4**	**5**

Lead Time Efficiency

The company transportation is efficient in moving products					
The company uses efficient route by planning ahead					
The company transport and drop off goods to customers on time					
The company selects the right delivery vehicle					

Transport Responsiveness

The company is responsive to customers demand					
The company's order fill accuracy is efficient					
The company accommodates changing sales volume					

Information Sharing

The company's Customer Database is up to date					
Customer database is shared with the right stakeholders within the Company					
Our transportation service delivers products to the right place needed without difficulties					

Transport Coordination

Outlets are well connected with the Company					
Transportation service of our company is flexible					
Our transportation service is cost efficient					
The company provide dependable delivery					
There a better tracing and tracking practice					

Section III: Questions related with Supply Chain Performance

Please indicate the degree of your agreement/disagreement with the following statements associated with the measurement of employees' commitment. (By ticking (√) the alternative number that best describes your view**)**

Factors	**Strongly Disagree**	**Disagree**	**Natural**	**Agree**	**Strongly Agree**
	1	**2**	**3**	**4**	**5**
Lead times have improved					
Service delivery has improved					
The number of orders shipped on time has improved.					
Deliveries are free from damage					
Customers complains have decreased					
Branches sales have improved					

If you have any additional comment or suggestion, please add in the given space below

---

Thank you very much!!

APPENDIX B

SEMI STRUCTURED INTERVIEW QUESTIONS

Questions are prepared to assess the effect of Supply Chain Performance in the Transport Function

(The case of CCBA Ethiopia Head Office Addis Ababa)

A. How do you explain the relationship between Lead Time Efficiency and Supply Chain performance?

B. How do you judge the relationship between Transport responsiveness and Supply Chain performance?

C. How do you judge the relationship between Updated Information and Supply Chain performance?

D. How do you judge the relationship between Transport Coordination and Supply Chain performance?
